The Mining Journal

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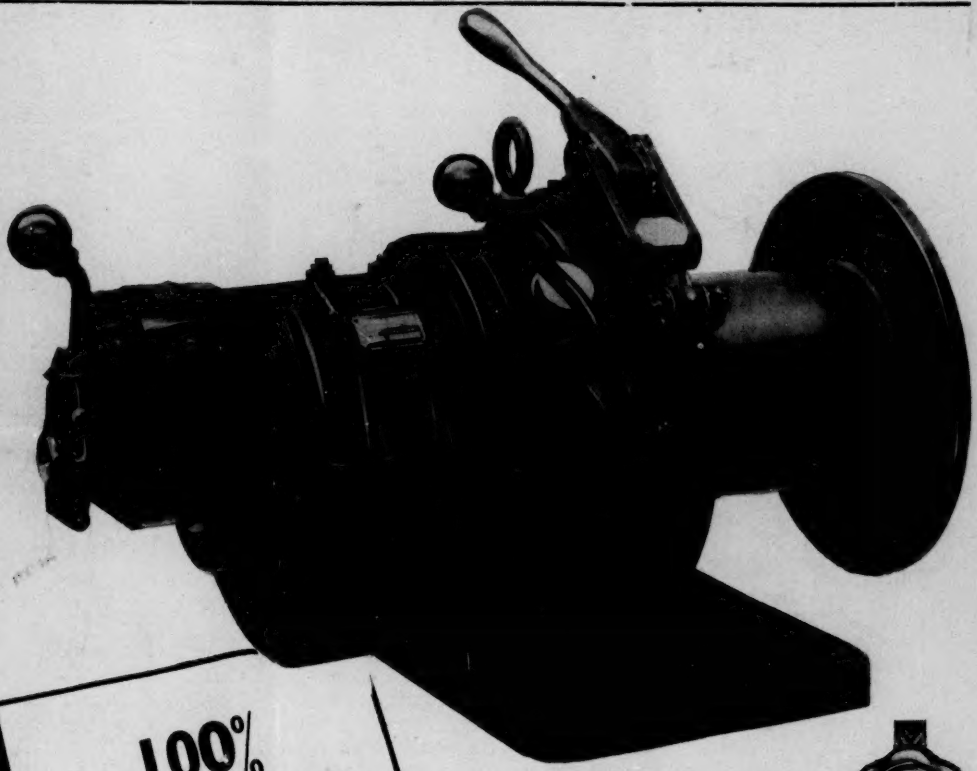

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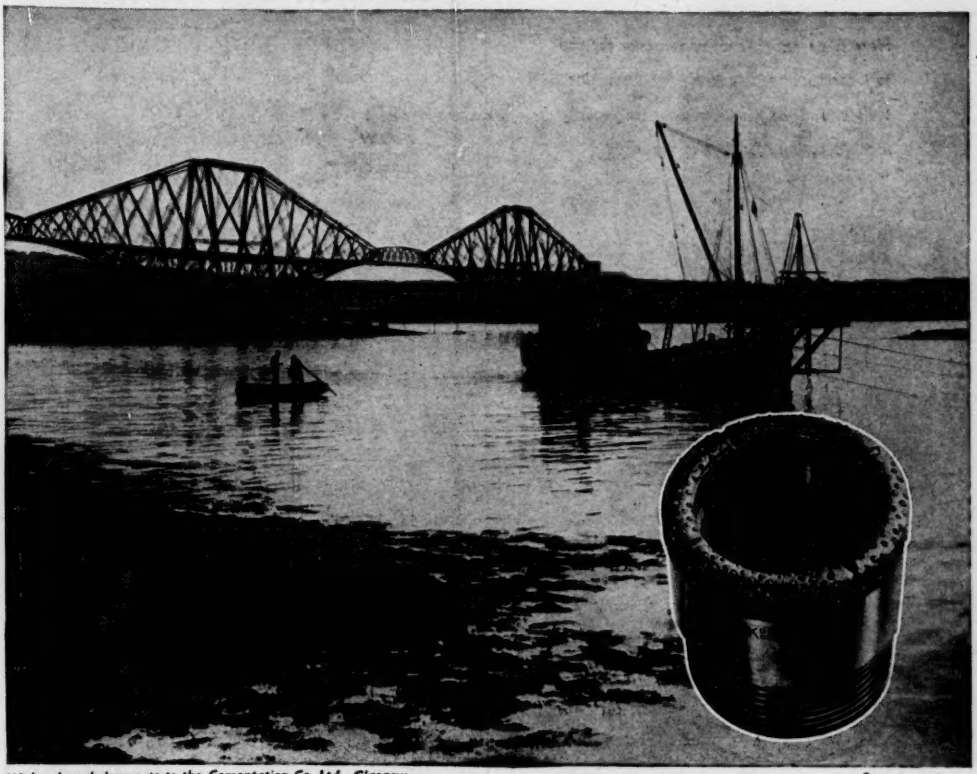

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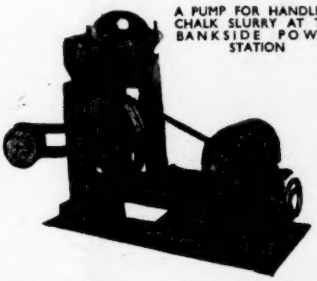

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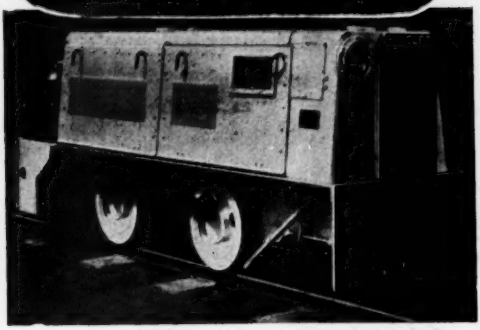

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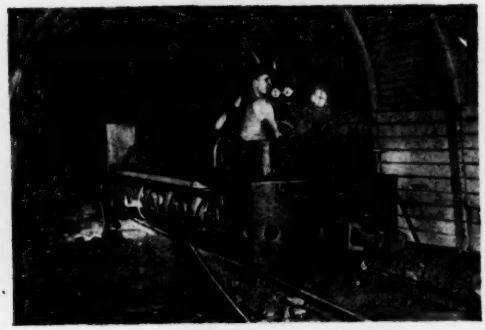

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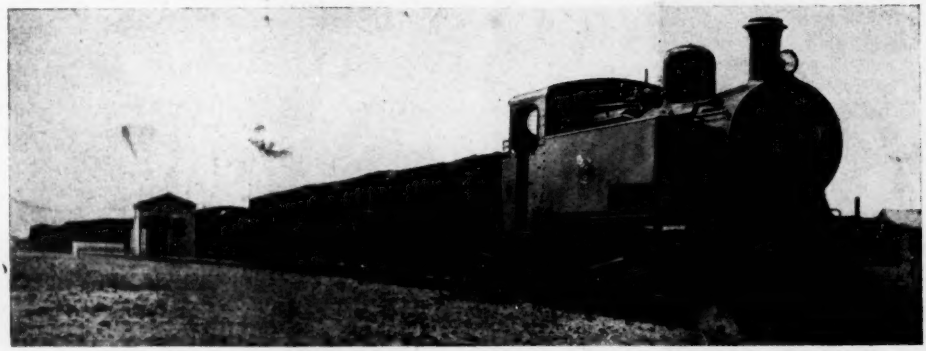
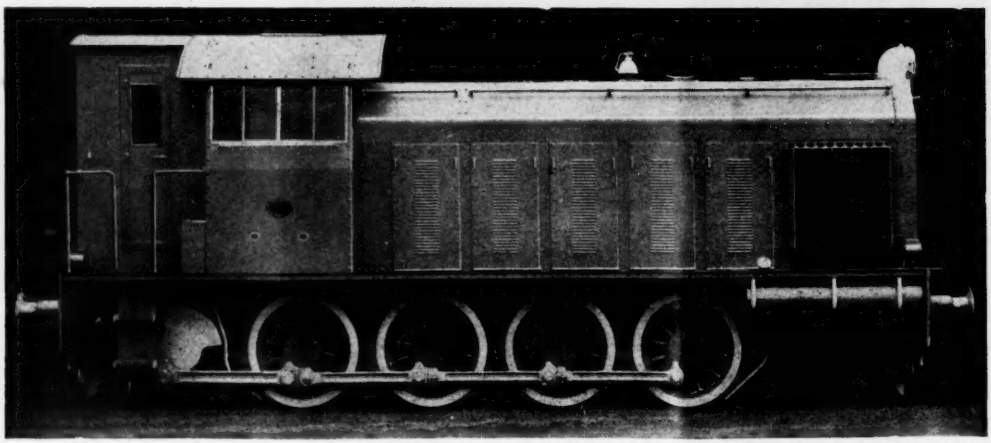


48-ton Hunslet eight-coupled steam locomotive on 650-ton train, Nchanga copper mines, Rhodesia



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"	"	"	34	2% Ni-Mo (lower C.)		
"	"	30			351	½ Ni-Cr
"	"	25			361	"15" carbon low-alloy
55–75	86–118	35	36T	3% Ni-Cr		
55 min.	86	"	325	Low Ni-Cr-Mo		
"	"	25	35	2% Ni-Mo (higher C.)		
"	"	20			352	1 Ni-Cr
"	"	15			362	"20" carbon low-alloy
65–80	102–126	30	36V	3% Ni-Cr		
65 min.	102	"	38	5% Ni		
"	"	20			353	1½ Ni-Cr
"	"	—			363	"25" carbon low-alloy
75 min.	118	20			354	1½ Ni-Cr
85 min.	134	25	39A	4½% Ni-Cr		
"	"	"	39B	4½% Ni-Cr-Mo		
"	"	"	320	2% Ni-Cr-Mo		
"	"	"			355	2 Ni-Cr-Mo (low-Cr)

Eight new specifications for case-hardening steels have been issued by the British Standards Institution. The new steels are intended to replace, as an emergency measure, the more highly alloyed case-hardening steels in current use.

The table gives details, based on mechanical properties, of the new economy steels which are alternative to the standard alloy steels. Many of these standard steels will again be available when the present situation has passed.

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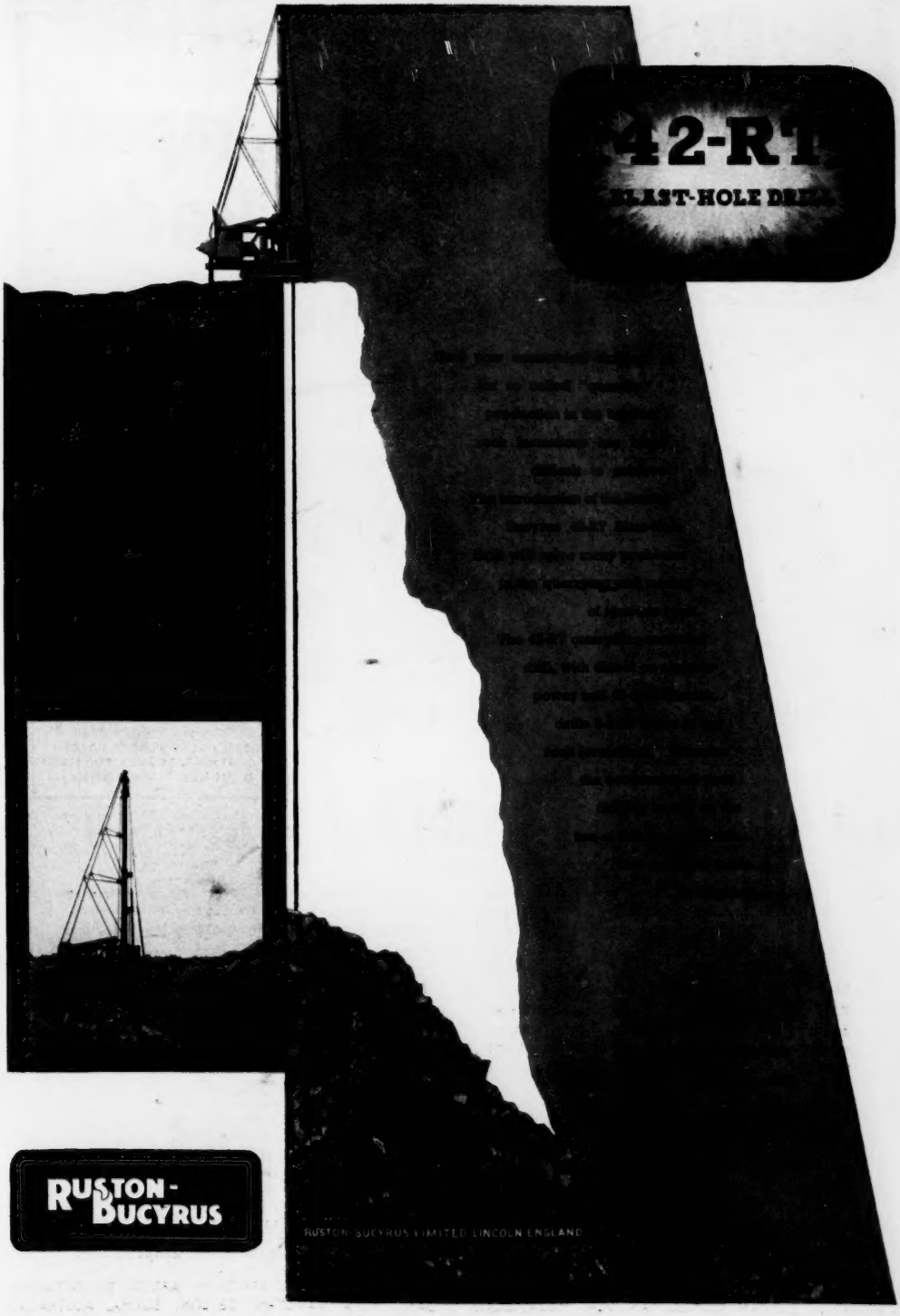
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NOTES AND COMMENTS

"An Economic Victory for the United States"

The tin industry has been dragged by the forelock into the arena of United States politics. There are several fundamental economic issues before the people of the United States to-day; not merely the outstanding issues of the New Deal and the Taft-Hartley Act, but the wide question whether the United States is to look inwards, as its main policy, to the intense stimulation of its natural resources to supply its enlarged requirements of minerals and metals, or is to accept the role favoured by Mr. Truman and advocated in the Paley Report, of seeking a solution by a huge international drive to stimulate production abroad to meet the growing need. So far the activities of the "Buy American" proponents has been directed principally to the oil and tin industries. Last week we expressed the opinion that the choice of Mr. Dwight Eisenhower as Republican candidate for the Presidency clarified the outlook and was a definite victory for the internationalists, but this is perhaps an oversimplification of the situation. Mr. Truman has been constantly hampered by possessing only the tenuous majority of two in the Senate, and should either Mr. Eisenhower, or Mr. Truman or one of his nominees, be the next President, either may find vested interests too strongly entrenched in the Senate to give him an entirely free hand. This consideration may perhaps help to explain the emergence of powerful movements seeking to control the President's freedom in international economic policy.

Here we must confine ourselves to such manifestations as are making their appearance with regard to the tin industry which, indeed, are exceedingly complex. The situation centres around the activities of the Senate Preparedness Committee under the chairmanship of Senator Lyndon Johnson, the earlier report of which in 1951, is now notorious. This Committee last week issued a further report, which while largely a repetition of its earlier allegations of "gouging" of United States consumers by foreign interests discloses what it declares to be the purchases of tin since Jan. 1 by the Reconstruction Finance Corporation—the sole United States purchasing agent— which it claims "saved the country $500,000,000" and whose stoppage of buying it claims resulted in "an economic victory for the United States."

These activities may have stemmed from the expectation that Senator Taft would obtain the Republican nomination, and been intended to facilitate that canvas. To-day they may be designed to get some such plank written into the Republican platform for the November election. Be that as it may, these purchases are said to aggregate about 84,000 tons of tin since January last: 20,000 tons under the Truman-Churchill agreement (presumably of Malayan and Nigerian origin); some 19,000 tons from Indonesia; 8,000 tons from the Belgian Congo; and 13,000 tons from the Bolivian producers accumulations after the U.S. purchases ceased. This last purchase seems to have been, more or less, distress stocks acquired at 117½c. per lb. before the nationalization of the industry took effect. As will be seen, these figures total, in round figures 60,000 tons, leaving some 24,000 tons to be otherwise accounted for, and regarding the source of which we can offer no suggestion. As the committee gives the current annual requirements of the U.S. as some 53,000 tons, further additions to the U.S. stockpile are complacently assumed. Even without allowing for reduced U.S. consumption this year due to the steel-workers strike, the U.S. now holds a stock of tin which dominates the whole tin outlook. For over 30 years we have consistently warned Tin Restrictionists of the danger of building up antagonism among U.S. consumers by restricting output in order to enhance prices, now the consequences of this unilateral outlook are unfolding themselves, as "buffer stock" policy is seen in reverse.

Of minor but still definite importance are the developments in Bolivia. As was to be expected, a new revolutionary government bent on a clean sweep, Señor Martinez Vargas with his earlier Patiño background has been recalled and a new U.S. ambassador, Señor Victor Andrade, appointed by the Estensoro Paz Government. He gave as his first objective on his arrival in the U.S. the negotiation of a new tin sales agreement. Presumably in parallel with this move, Mr. Leon Henderson, described as "former U.S. Government chief," declared that he and "his associates" had a contract from the new Bolivian Government for the disposal of the entire Bolivian production, and had offered it to the R.F.C. He is reported to have disclaimed any knowledge of any existing contracts for any Bolivian tin, though existing engagements are generally understood to have still several years to run; in any case, however, the nationalization of mines and exports in his opinion wiped out all private contracts.

The R.F.C., not unnaturally, received this approach with some reserve, all the more as they have all the tin they can use for a long time to come and in any event the latest report from Washington is that Mr. Henderson's contract expired on June 28 last and that direct negotiations betwen the Bolivian Government and the U.S. are being resumed.

Should the Bolivian Government arrange to dispose of all their tin to the U.S. this would present of course a very serious problem to the tin smelting industry in this country. In the first half of this year we imported 27,235 tons of concentrates, of which Bolivia supplied 20,617 tons. The switching of these supplies to America would negative the whole co-operative policy arranged between Mr. Churchill and Mr. Truman in the new year whereby we supplied the United States with 20,000 tons of Empire tin and facilitated similar deals with other producing countries.

Apologists for the U.S. tin price policy may perhaps seek to defend it on the broad grounds that the future world reserves of tin ore are being steadily depleted, with little prospect of any revival in their replacement, and that therefore any move which tends towards conservation is wise but this ignores the consideration that not only would it arrest the finding of fresh venture capital which might result in possible future discoveries, but that existing tin mines and tin fields, once closed down, can seldom, and only by great good fortune be revived, especially once the necessary labour is dispersed and lost. Persia gives us a present example regarding such an outcome.

The Colonial Affairs Debates

The debate at the end of last week on Colonial affairs in the House of Commons was necessarily, as usual, selective—with 50 separate colonial territories involved. This is inevitable. As the debate developed, the territories chiefly prominent were East and West Africa, and Malaya. The Colonial Secretary declared that agriculture remained the prime source of wealth in colonial territories, though mineral developments and the extractive industries called for parallel development. Otherwise the mineral industry received scant attention.

Mr. Lyttelton stated that there was some prospect of a large lead-zinc-sulphide proposition being developed in Nigeria (see *The Mining Journal*, May 30), and hinted at the installation locally of a roasting and smelting plant, in order to secure the sulphuric acid needed to make superphosphate from Nigerian rock phosphate. He also told the Committee that the production of copper from colonial territories had risen in the last thirty years from 150,000 to 313,000 tons a year. This statement seems to suggest that there has been no development in copper mining outside Northern Rhodesia in that period. Mr. Lyttelton also referred, in what was apparently intentionally vague terms, to the coal mining project of the Colonial Development Corporation, of potentially great economic importance—probably the Tanganyika area.

Much was said about Malaya but we find no reference whatever to the tin-mining industry or to the vital question of renewal of prospecting in the life of this predominantly alluvial tin-field. As Mr. Lyttelton had a long connection with the tin industry before the war, his silence may possibly be significant. He expressed himself optimistic about overcoming eventually the battle against Communism but it is somewhat startling to read that as against a force of some 4,000 to 6,000 armed terrorists, there were engaged 60,000 regular police and about 250,000 part-time police. These figures may be interpreted as showing the extreme difficulties of the Malayan security problem, or the lack of intelligent approach to the problem, or both, according to the reader's fancy.

Naturally, the Colonial Development Corporation figured extensively in the debate and Mr. Lyttelton described the general outlook of the Corporation in the past as "hubristic" and deplored the world publicity engendered by the ridiculous follies which were committed and which could have been avoided by the most ordinary commercial prudence. A former Colonial Secretary, Mr. Griffiths, claimed that the cumulative loss of the Colonial Development Corporation's field of operations was only £4,500,000, but apparently accepted that this represented a quarter of the total capital ventured.

In the House of Lord's debate on Tuesday last attention was called to the effect of the United States policy in seeking to depress tin and rubber prices in the struggle against Communism in S.E. Asia.

Developing Portugal's Promising Iron-Ore Deposits

A recent issue of the U.S. Bureau of Mines' *Mineral Trade Notes* contains interesting details of the Moncorvo iron-ore deposits in the Braganca district of north-eastern Portugal. Twenty-three concessions for approximately two-thirds of these deposits, covering 1,202.29 hectares, have been leased by the Sociedade Ferrominas, Lda, from Schneider & Cie. The ore deposit extends for about 15 kilometres on the Serra do Reboredo and on the Cabeco de Mua which is some hundreds of metres north of the Serra do Reboredo. Haematite occurs in silurian formations of quartzites and schists, the ore being found with quartzite. It is a hard ore with a high specific gravity, producing virtually no fines in crushing or stripping. Analysis of the first five shipments averaged 90 per cent lump and 10 per cent rubble. On the concessions worked by Ferrominas, six parallel beds, dipping at an agle of 25° to 30° at the outcrop and flattening out to a dip of 15° at depth, are found. Thickness of these beds is given as 50 centimetres and upwards. Probable and possible reserves have been estimated by Dr. J. M. Cotelo Neiva, of Coimbra University, at 480,000,000 tons for the Sierra do Reboredo, and at 50,000,000 tons for the Cabeco de Mua. It is believed that the company's concessions contain a minimum of 80,000,000 tons of possible and probable ore, most of which is direct smelting.

Development began in April of last year, and small-scale production started soon afterwards. Up to the end of October, 1951, 13,000 tons had been shipped and the company expected to ship another 12,000 tons last year, moreover, it had contracted for the sale of 150,000 tons in the current year. Whether this target will be reached depends, however, on extensive mechanization, part of the machinery for which is now on order.

Analyses of the first five shipments indicate that the ore contains from 48 to 52 per cent Fe, 16 to 22 per cent silica, maximum 0.40 per cent phosphorus, and 0.01 per cent sulphur, on a dry basis. The moisture content of the ore, as mined, is extremely low, not exceeding 0.20 per cent.

All ore has been won by open cut methods but an adit is being driven to intersect the beds in preparation for underground development. Room and pillar stoping will be used underground. Crushing is by hand, requiring 60-70 men. At present, crushing costs 30.00 escudos per ton and transport to the railway station by truck costs 11.50 escudos. However, it is expected that the installation of a crushing plant will reduce crushing cost to 1.5 escudos and that the completion of a ropeway will reduce transport costs to 1.50 escudos per ton. The ore is crushed to a maximum of 4 in. and a minimum of ¼ in., the only other preparation is hand-picking to minimize the silica content, but as the silica is finely disseminated throughout the haematite, it seems unlikely that beneficiation will be economically practicable in the foreseeable future.

The Coal Industry

(From Our Coal Correspondent)

The coal situation in Western Europe has improved greatly since the beginning of the year. It is now practically certain that the deficit will be substantially reduced this year and that henceforth it will become possible to curtail imports from the U.S.A. very considerably. Great Britain is contributing largely to the general improvement.

THE EUROPEAN OUTLOOK

The outputs shown in the table were predicted up to the end of 1953 by the Ministerial Group of O.E.E.C. from data supplied by the various governments concerned. Some of the factors taken into account in arriving at these figures may not have the same significance in all cases. In France and Belgium, for example, there is no great difficulty in getting labour for the mines and the problem of raising the output is that of increasing the load on the existing equipment and extending the working faces. In Great Britain, on the other hand, where there is still a shortage of labour, the immediate problem is to increase the productivity of the available labour force by developing new and more effective machines, particularly for the mechanical loading of coal on longwall faces. Outputs are going up at present in all the major coal producing countries and the estimates shown in the Table for 1953 may be exceeded in Great Britain and possibly also in Western Germany.

EUROPEAN COAL PRODUCTION (in metric tons)

Country	Year 1937	1946	1950	1951	1952	1953
United Kingdom	224.2	193.0	219.8	226.42	229.4	240.0
W. Germany.....	137.0	55.0	110.75	118.93	126.0	132.0
France	45.1	48.8	52.0	54.4	57.4	58.2
Belgium.....	29.8	22.8	27.4	29.67	31.0	32.0
Netherlands	14.3	8.3	12.24	12.42	12.8	13.0
Saar	13.4	7.9	15.0	16.26	17.0	17.5
Others	4.4	5.2	4.9	5.2	6.0	6.3

GREAT BRITAIN

The prospects for the coal industry in this country are now probably better than they have been since the war. More workers have been entering the mines since November and the weekly average number of men on colliery books in the first half of this year was 711,200 compared with 700,200 during the corresponding period in 1951. Young men and boys are now being trained in increasing numbers and, for the first time in many years, the upward trend in the average age of miners has been checked. The National Coal Board are at present conducting a pit by pit survey to see where accommodation at the face can best be obtained for these trainees by extending double-shift working or by the introduction of continuous mining. Efforts are also being made to open out new faces and the recent slight drop in the output per manshift may be accounted for by the greater amount of development work which is being done. Thus, although the total output from deep mines and open-cast mines is going up it is not yet increasing in direct proportion to the number of workers on the books.

The total output in the first 27 weeks this year was 118,769,800 tons compared with 116,877,900 tons in the same period last year. Mainly as a result of this, and partly as a result of a downward trend in consumption, the Minister of Fuel and Power was able to announce recently that a further allocation of coal for export had been made. The proposed amount for the whole year now stands at 12,500,000 tons, compared with 7,925,000 tons in 1951. It is estimated that the increase in bulk together with the higher price will bring in about £60,000,000, or about £30,000,000 more than last year. Some doubts are being expressed in political circles about the future prospects of Britain's coal trade in Europe should Poland and Germany once again become serious competitors for this trade. Whilst the present coal shortage in Europe makes this a remote contingency, it is nevertheless important from a psychological standpoint that the Government should endeavour to allay any suspicion in the coalfields that an overseas market is being built up which might eventually collapse and leave a redundancy of miners in exporting areas such as South Wales.

PARLIAMENTARY DEBATE ON FUEL AND POWER

In the course of the debate on Fuel and Power in the House of Commons on July 17 Mr. Geoffrey Lloyd stated that if all goes well coal production next year should be above the average of the years before the war and exports should be worth four times as much as they will bring in this year. Great stress was laid in this debate on the need for fuel economy at home and, in replying to the debate, he outlined some important plans which are being made to bring about a greater degree of co-ordination in the utilization of oil, gas and electricity. He stated that the new power stations which came into operation last year have already saved 800,000 tons of coal by virtue of their high thermal efficiencies and in a year from now other new stations may be saving a further 1,000,000 tons of coal a year.

New and more efficient carbonization plants are being constructed and experiments are being carried out on total gasification to enable a wider variety of coals to be used to help the gas undertakings to meet increased demands. The Midlands gas grid is being extended from Sheffield to Nottingham and Birmingham and the coke ovens and oil refineries in these areas are to be connected to it so that the surplus gases produced by these industries can be used to supplement the output of the National Gas Board plants.

The most revolutionary changes, however, will take place in connection with the generation and transmission of electrical energy. The original electrical grid was designed to balance out load inequalities rather than to transmit energy in bulk in one direction but the new grid, which is to operate at 275,000 volts, is designed to transmit energy from the coalfields to large towns and industrial centres. The British Electricity Authority are now planning to build power stations in the East Midlands coalfields to burn low grade fuels and eventually the grid potential may be raised to 400,000 volts to enable a load of 2,000,000 Kw. to be transmitted to London over a distance of 120 miles. This would reduce the amount of coal which has to be conveyed to London from these coalfields by rail by as much as 4,500,000 tons a year.

The Minister also revealed that a joint committee had been set up by the British Electricity Authority and Electricité France to examine the possibility of interconnecting the British and French grids by means of a submarine cable across the channel. It has since been announced that the interim report of this committee has been approved in principle by both sides and each Authority will now contribute £125,000 towards a development programme. The cable will probably be laid in the neighbourhood of Folkestone across to the nearest point on the French coast and the cost of the scheme when completed will be about £4,500,000. It appears that the diurnal and seasonal demands in France do not coincide with those in the United Kingdom and the linking of the two grids will help to solve some of the peak-load problems in both countries.

India and Ceylon

(From Our Own Correspondent)

Colombo, July 3

The Government of India has announced rewards for the discovery of new deposits in India of uranium and beryl ores. The Government reserves the right to determine whether a particular discovery is the first from a particular location. An award up to Rs.10,000 may be given for the discovery of a new deposit of uranium, and up to Rs.2,000 for the discovery of new beryl ores. The Government has also announced its decision to buy stocks of uranium ore or concentrate, containing not less than four per cent of uranium oxide. Until now the Government was not buying these stocks unless the uranium content was equivalent to 10 per cent.

Small deposits of uranium and thorium ores have been found in certain parts of Madras State. The best known deposits of uranium and thorium in India are in the southern tip of Travancore-Cochin State, around Cape Comorin. The Indian Atomic Energy Commission is at present investigating in Madras State the possible occurrences of these radio-active minerals in workable quantities and their future potentialities.

Beryl ore, also used in the production of atomic energy, is found in the Nellore district of Madras State, in fairly good quantities. Beryl, in its crude variety, is used as a moderator in the manufacture of atom bombs, and in the clear variety as semi-precious stone.

INDIA'S IRON ORE RESERVES

A survey of the Bellary district in Madras State has revealed the existence of iron ore estimated at 130,000,000 tons. At Rowghat, in the Bastar district of Madhya Pradesh, iron ore resources amounting to about 800,000,000 tons have been located.

The ores are described as high grade and occur in the shape of massive hills. The deposits are only 150 ft. deep, but experts think that the ores extend to a greater depth, in which case the resources will be much higher. With the location of these deposits, the total iron ore deposits of India are computed to amount to over 10,000,000,000 tons. The annual output is about 3,000,000 tons, mined mainly in Singhbum in Bihar, Mayurbhanj, Keonjhar and Bolai in Orissa, and Bhadravati in Mysore.

Recent investigations have also shown the presence of bauxite of good quality, amounting to 100,000 tons in Mandla, Drug and Balaghat districts in Madhya Pradesh In Shahdol district of Vindhya Pradesh the presence of 570,000 tons of ore has been located.

INDIA TO EXPORT 250,000 TONS OF SCRAP

Indian firms have contracted to sell about 250,000 tons of scrap iron to the United States of America, the United Kingdom, Japan and European continental countries, with Japan and the United States as the principal buyers. The quantity includes contracts made by the Tata Iron and Steel Co., the Indian Iron and Steel Co. and the Steel Corporation of Bengal. The contracted price is reported to be roughly Rs.140 per ton, or about half the cost price of steel. The Government of India decided to permit the export only when it was quite clear that steel manufacturers in India found it more economical to use iron ore rather than go to the labour and expense of crushing the huge blocks of scrap and processing them for further use.

A United States firm, the Western Steel Corporation of New York, which has signed a contract for scrap iron with an Indian firm, has planned to set up special equipment at Jamshedpur for breaking, preparing and loading the scrap. The demand for scrap iron from the United States, Japan and the United Kingdom has been on the increase and fresh inquiries have been received. The sale will also augment India's dollar and other foreign exchange earnings.

India is unlikely to accept the Krupps' (German) offer to set up a pig iron plant in Orissa. A Japanese proposal, instead, is gaining favour. The German proposal amounts to little more than the sale of machinery. India demands active participation in the venture and the Japanese proposal, is stated to satisfy this requirement. Japanese interests are preparing to invest about Rs.100,000,000 in the form of blast furnaces and other necessary equipment. India's share of investment will be about Rs.110,000,000. Japan is also willing to provide the technical personnel. Japan will share the profits with India in proportion to her investment. Payment will be in kind. Japan will thus receive iron ore, coking coal as well as part of the mill's products, including pig iron. Indo-Japanese collaboration will give India 350,000 tons of pig iron which is expected to meet India's immediate needs.

CEYLON'S THORIUM PROSPECTS

Experiments carried out at the pilot factory established by the Government of Ceylon at Katukurunda for the extraction of thorium from deposits of monazite sand found on the beach there are said to be very promising. Small quantities of uranium (three to four per cent) have also been found in an impure state in the monazite sands. The experiments are to be continued until it can be established that the extraction of thorium from monazite deposits in Ceylon is a commercial proposition. The deposits of monazite sand found in the coastal regions of Ceylon and Travancore in South India, are said to contain between 24 to 26 per cent thorium.

India's output of thorium is sold without any restrictions, but the export of raw monazite is totally banned.

There has been, so far, no export of monazite from Ceylon. The machinery for the pilot plant at Katukurunda has been loaned to the Ceylon Government by a British firm for the purpose of finding out whether thorium and uranium are found in sufficient quantities in Ceylon for commercial purposes. Electro-magnetic separation of samples is being carried out at the pilot factory. Monazite concentrates on the beaches occur in various parts of the island. Investigations on the project have been carried out recently by the Ministry with the advice and assistance of a Consultant obtained under the United Nations Technical Assistance Programme. The scheme has now been finalized and the total capital cost for the establishment of the ore-dressing plant is estimated at Rs.6,307,840.

The ore-dressing plant is designed to handle 125,000 tons of raw sand per year and the annual output will be at least 75,000 tons of ilmenite, 4,000 tons of rutile and 4,000 tons of zircon. The plant will be a self-contained unit. It will be fully mechanized.

STEEL FACTORY APPROVED

Ceylon will shortly undertake the production of a fair proportion of the country's requirements of iron and steel and thus relieve the acute shortage, particularly in the sphere of building work. The Government have now approved the establishment of a factory for refining iron ore, following the discovery of extensive deposits in several parts of the island. A survey of this project has been carried out by a United Nations official, Mr. J. B. David. The survey has indicated the feasibility of setting up a plant for refining iron ore. Extensive deposits have been found at Ratnapura, Ambalangoda and Akuressa in the island; the ore is found as surface deposits from two to three ft. to about ten ft. deep. The exploiting of these ores should, therefore, be very economic.

COLONIAL MINERALS DEVELOPMENT—XII.

Tanganyika

By A. G. THOMSON

In the following article, the twelfth in a series devoted to the mineral wealth of the smaller British overseas territories, the author describes the vigorous measures being taken to develop the mineral resources of Tanganyika.

Tanganyika has an area of about 360,000 sq. miles and is bounded on the north by Kenya, Lake Victoria and Uganda; on the west by Belgian territory and Lake Tanganyika; on the south-west by Northern Rhodesia, Nyasaland and Lake Nyasa; on the south by Portuguese East Africa, and on the east by the Indian Ocean. In 1946 the population consisted of 14,000 Europeans, 59,000 Asiatics, and 5,500,000 Africans.

In 1950 Tanganyika's mineral output included 65,127 f.oz. of gold, 164,996 ct. of diamonds, and 94 l.tons of tin. The effect of an expanded and strengthened Geological Survey Department in developing the territory is beginning to be felt.

Tanganyika's most important goldfields are those of the Lake Victoria region, which include the Musoma, East Mwanza and south-west Mwanza fields. Production from reefs dates from before the war of 1914-18 and during the period between the two wars was steadily expanding. A marked increase was recorded in 1939, when a new mill with a capacity of 250 tons a day began operations at the Geita Mine in the south-west Mwanza goldfield. A new plant at Buhemba started up towards the end of 1939 with a capacity of about 120 tons a day, while a plant with a capacity of 100 tons per day came into operation at the Mara mine in the Musoma district. As a result of these developments the total bullion produced in Lake Province increased from 7,431 f.oz. in 1935 to 84,258 f.oz. in 1941. In the latter year the Musoma goldfield crushed 95,457 l.tons and produced 31,015 f.oz. of gold to an average recovery of 6.4 dwt. About 88 per cent of this came from the Muhemba, Mara and Ikungu mines.

VARIED DEPOSITS OF THE TERRITORY

The Lupa goldfield in the Southern Highlands started in 1922 as an alluvial field. Since 1936, there has been a steady decline in its output from placer gold, but a corresponding increase in that obtained from quartz reefs, which are abundantly developed over an area of nearly 1,000 sq. miles. In 1939 there were over 40 producing mines in this field, the most important producers being the Saya, Ntumbi and Rukwa mines. Other auriferous areas include the Iramba plateau, the Sekenke goldfield, and the Ukonongo goldfield. Underground work at Sekenke, the oldest and deepest mine, was suspended in 1942.

Diamonds were discovered near Mabuki south of Lake Victoria before the 1914-18 war, but exports did not start till 1925. They come almost entirely from detrital deposits containing the characteristic suite of minerals associated with kimberlite occurrences. A considerable number of these occurrences have been found, chiefly as pipes but also as dykes. The outstanding feature of diamond production in Tanganyika has, of course, been the great mining adventure of Dr. E. T. Williamson. As a result of which the territory was accorded a 10 per cent share for five years of the world sales of the Diamond Producers' Association, starting in 1947. The agreement expired at the end of last year.

The Karagwe Chiefdom, in the Bakobu district, has been the territory's chief source of tin and also has tungsten deposits which have been exploited. A deposit of good quality talc was discovered in the Pare district shortly before the war. Salt is produced in the coastal areas by the evaporation of sea water and inland by the evaporation of water from brine springs. Red ochre has been produced for local consumption in Arusha and Korogwe. There is a wide distribution of muscovite mica.

The areas chosen for immediate attention by E.C.A. geologists are the tinfields of Karagwe and the Lupa goldfields. Important changes in the Karagwe tinfields are foreshadowed. The Kyerwa Syndicate is now controlled by Messrs. W. E. Moulesdale & Co. Ltd., who hold 52 per cent of the shares. It is understood that some £80,000 is to be spent on developing the Kaborishoke and Rwabushoga mines. The Colonial Development Corporation has purchased the Murongo alluvial ground. The K.C. Mines Ltd., mining wolfram on the east side of the Kagera River gorge north of the Sina Arena, are now producing about 50-100 tons of concentrates annually.

The Colonial Development Corporation has taken over the sole prospecting rights for coal and is now engaged

A large outcrop of coal on a river-bank in the Ngaka River area

in an extensive exploration of the Ruhuhu coalfield. The Geological Survey has assisted the Corporation to explore the Ngaka and Ketewaka coalfields. The Ketewaka-Mchuchuma coalfield was surveyed geologically on the scale 1 : 12,500, and the geological maps are now being used by the Corporation for locating their borehole sites. Extensive drilling operations in the Ngaka coalfield are yielding encouraging results and the Geological Survey has made preliminary examinations of the Kivira-Songwe and Galula coalfields.

A small new coalfield was discovered in the Southern Highlands Province, in which a talc body of considerable dimensions was also located. In the northern boundary region Lake Natron was surveyed and a preliminary geological and chemical examination showed that some 100,000,000 tons of salts occur as solid reserves. In addition, there is perhaps a further 50,000,000 tons of various salts, including about 1,000,000 tons of potassium chloride and 300,000 tons of sodium phosphate. A detailed survey of the other salt lakes is still in progress. A gypsum deposit situated on the Tanga line has been taken over by the Overseas Marketing Board and it is estimated that some 750,000 tons are available. Smelting tests have been carried out in Sweden on titaniferous magnetite from the Liganga. Additional smaller deposits of iron ore have been discovered near the main iron ore in Southern Njombe.

The Mineral Deposits of Iran

The following article, condensed from *Mineral Trade Notes*, Vol. 33, No. 6, gives details of the general metallic mineral deposits of Iran. It makes particular mention of chromium, copper and iron ore, and deals briefly with the mineral resources of the country.

With the exception of chromium, copper and iron ore, the mineral deposits of Iran are at the moment evidences only. Of the metallic minerals, an antimony mine is in operation at Kuh Shurab, 70 kilometres west of Ferdows in the province of Khorassan. The property has an estimated reserve of 300 tons. No estimate of reserves has been made of the Sizal mine, 130 kilometres south-west of Meshed, and traces of antimony have been found at Patiari in the Anarak district.

MINERAL DEPOSITS IN PRECIS

Exploitation of metallic arsenic is being carried on by primitive methods at a point 36 kilometres north-west of Takab and 230 kilometres north-west of Hamadan with traces of arsenic in evidence for a radius of 50 kilometres. The mine is 50 metres long, 26 metres wide and 96 metres deep, with an estimated annual output of 12,000 tons.

Cobalt is found in the Ghamsar Kashan region and at Anarak, and an attempt was made to explore Iran for gold in 1946. Traces were found to be present in many parts of the country, while silver, combined with lead sulphide, is found in small quantities in Zenjan, Anarak and Sunkoun. Evidences of lead deposits are found in the areas surrounding the Central Desert and at other places.

The entire output of the manganese produced at Robat-Karim, 50 kilometres south-west of Tehran, is used by the Kerej foundry. The ore reserve is estimated at 240,000 tons and analysis has shown first class ore to contain 50 to 80 per cent pure manganese. Second class ore contains between 30 to 50 per cent manganese. Indications of molybdenum have been found in two areas, and traces of nickel have been discovered 100 kilometres south of Meshed at Robat-Sefid and in the Anarak area, 90 kilometres from Nain. Reserves are estimated at 500 tons containing up to 45 to 75 per cent nickel. Traces of zinc have been discovered at five places.

Of the non-metallic minerals, an estimated reserve of magnesite totalling 80,000 tons is reported at Riari, a suburb of Meshed, estimated to contain 98 per cent pure magnesite. The mineral has been discovered also at Darbagh, south of Nain. Asbestos is found at Sineh-Chand, at a place 50 kilometres west of Meshed, at Mokran in Baluchistan and at Zenjan.

In 1951 an important deposit of iron ore, mostly limonite, was discovered in the vicinity of Shah-Zend, 80 kilometres south of Arak. It is estimated that this deposit contains 60,000,000 tons of iron ore averaging 47 per cent iron. Steps are being taken to mine and export some ore in the future. Iron ore has been found also at Khan-Qara-Dash, south-west of Farijan, in the estimated amount of 1,000,000 tons. Around the Farijan area, near the Quizil-Ozan River, iron ore (haematite) is estimated at 2,000,000 to 3,000,000 tons. Iron mines are found in other places and iron ore, mostly haematite and magnetite, has been discovered 12 kilometres north-east of Semnan. Visible reserves are estimated at 400,000 tons. At Hamirat and Sheikbab, 60 kilometres north of Semnan, in the Sangsar area, more important masses of ore have been found. Semnan's mines have a reserve reported to be 2,229,000 tons.

DEVELOPING CHROME DEPOSITS AT ZIRJAN

Important deposits of chrome ore were discovered in the southern part of Iran in 1951. The deposits consisted of numerous veins, the reserves of which have been estimated as varying between 1,000 and 10,000 tons each. A total of 200,000 tons of usable ore has been located with the most important deposits in the Baft district, 300 kilometres north-east of Bander Abbas.

A sum of 1,500,000 rials of the 10,000,000 rials allocated for the development of the Zirjan district, has been allocated for the development of the chrome deposits. A 200 kilometre road would have to be built to connect the district to Gahkum, which is half-way between Zirjan and Bander Abbas. These deposits can be worked by surface mining. No work has been undertaken, and, considering the extent of the road that has to be constructed before operations can begin, the sum allocated will not be enough to make any real headway.

Other chrome mines found in Iran are those at Farumad, 40 kilometres north of Abbas-Abad. Analysis shows the ore to contain 40 to 50 per cent Cr_2O_3, and reserves are estimated at 30,000 tons. One stretch of igneous rocks begins at Farumad and runs to a point just north of Sabzevar; another from south of Nishapur to Robat-Sefid; and a third from Fariman to the Afghan border. A mine at Robat-Sefid, 96 miles south-east of Meshed, is believed to have a reserve of 7,000 tons. Traces of chromite have been noticed in the Banshagerd mountains in Mokran province 100 kilometres south of Qasr-Ghand.

SMALL COPPER RESOURCES

Many traces of copper have been found in Iran, but the most important are in the Azerbaijan, and Zenjan provinces at Sangun mountain and Baghcheh-Bagh village in Arasbaran formerly known as Qaarajeh-Dah. Copper is also found around the Central Salt desert extending from Khorassan to Kerman in the district of Anarak, in Abbas-Abad, Sabzevar, Bahr-Aseman mountain south of Kerman, and Tabbas and some exploitation has been completed at the Sangun mountain mine. The Baghcheh mine, 140 kilometres west of Zenjan, has an estimated reserve of 4,000 tons. The Anarak mines are 84 kilometres north of Nain and are 1,400 metres above sea level. The Bagheri, Meskani, and Talmessi mines are in the Anarak area and explorations to date have revealed an estimated 9,500 tons of copper. About 1,832 tons of copper has been obtained from these mines and refined in the Ghani-Abad refinery near Tehran. Copper mines in the Abbas-Abad region and their locations in relation to Abbas-Abad are: Labkal, 20 kilometres east; Asiapu, 15 kilometres east; Bozorgdar, 10 kilometres east; Damanchalhadar, 5 kilometres west, Choghondar-Sar, 26 kilometres south-west; Gourkan, 20 kilometres south-west; and Yaghlur, 25 kilometres south.

Of the foregoing, the Choghondar-Sar and Bozorgdar mines are the most important. The Choghondar-Sar mine contains copper chloride and chalcopyrite and the Bozorgdar mine, cuprite and malachite. Exploration and exploitation have been carried on by the Government at mines 118 kilometres south of Sabzevar. Copper has been found throughout the area, but no estimate of reserves is available.

Some exploration has been carried on at the copper mines at Bahr-Aseman mountain south of Kerman. Traces of copper have been recorded at Rivarsan south of Tarom; Abiyek, 80 kilometres west of Tehran; Zalubulagh, 16 kilometres north-west of Jabun, near Demavand, Raz Shalvar mountain, 5 kilometres from Shamindar-Abad, which is 10 kilometres west of Mianeh; at Shah Issa Begly, north-west of Mianeh; Qala Yaghugh, 15 kilometres south of Siah-Kuh in Varamin; Sarvestan, 7 kilometres south of Yezd; and at Kharayegh near Yezd.

TITANIUM—II

Titanium—Its Treatment and Production

By GRAHAM OLDHAM, B.Sc., F.R.I.C., D.L.C., M.Inst.F.

The high chemical affinity of titanium ores for oxygen renders its reduction difficult necessitating treatment methods varying according to the nature of the ore. The main commercial process for the production of the metal itself is that due to Kroll, although an alternative method of approach, the furnace technique, has been adopted in Canada. In the second and concluding article which follows, these various processes used in the treatment and production of titanium are discussed.

Titanium possesses a high chemical affinity for oxygen and, in consequence, the ores are extremely difficult to reduce. The method of treatment varies according to the nature of the ore, but since most of the titania obtained is produced from ilmenite we will deal with the treatment of this first of all. The ore concentrate, which may contain up to 60% TiO_2 is digested with concentrated sulphuric acid at 150-180°C when both the iron and titanium are converted to the sulphates which may be leached out. The ferric sulphate in the solution is reduced to the ferrous condition by scrap iron and the solution concentrated, when some of the ferrous sulphate crystallizes. Subsequent hydrolysis yields a hydrated TiO_2 which is filtered and calcined. This is what might be termed the "text book" method and numerous variations are, in fact, employed, a few of which will be given.

The National Lead Co. claimed a method[6] whereby after digestion with concentrated sulphuric acid and extraction with water, the insoluble residue is heated at between 800 and 1300° C. for 1-4 hours in a reducing atmosphere or at 200-800°C. in a neutral atmosphere, the product then being added to the next batch for digestion. By this means it is claimed that improved clarification of the liquors is rendered possible. Clarification may also be obtained[7] by precipitating a colloidal sulphide in the acid liquor, followed by filter pressing. This may be achieved for example by adding antimony trioxide, sodium sulphide and glue, gelatin or other protein.

In a patent taken out by British Titan products Ltd.,[8] concentrated hydrochloric acid is pre-treated with barium chloride to remove any sulphate ions which may be present. Ground ilmenite is then extracted with this acid for five hours at not less than 70° C. By this means 89 per cent of the iron content is removed, together with only 0.5 per cent of the titanium and quite a good preliminary separation of the two elements is thus obtained.

SECOND STAGE OF TREATMENT

Whatever method of attack has been used the product will be reasonably pure titania which has then to be converted to the metal. As we have previously stated, the metal has a high affinity for oxygen and the reduction of the oxide by sodium, calcium, magnesium, etc., does not yield a pure product. It was realized by Berzelius, as early as 1825, that it was desirable to convert the oxide to a halide and then reduce this, but even so a pure product was not obtainable. The usual technique which is adopted is to briquette the crude titania with one-third its weight of coke or coal, and then heat in chlorine above 500° C. to form the volatile tetrachloride which may then be fractionally distilled. The quality of the chloride, as might be supposed, greatly influences the quality of the metal and a method for the production of a high quality product has been described by Stoddard and Pietz.[9] The crude titanium tetrachloride is stirred with 2 per cent by weight of copper powder at 100° C to remove vanadium tetrachloride which may be present. The liquid is allowed to settle and then blown into a 65 gallon batch boiler provided with a fractionating column 4 in. diameter and containing 7½ ft. of packing. Silicon tetrachloride is distilled off, followed at a reflux ration of 4-5 by an intermediate fraction boiling below 135° C. The titanium tetrachloride so obtained contains not more than 0.015 per cent silicon tetrachloride and will ultimately yield a pure ductile titanium.

PRODUCTION OF THE METAL

The main commercial process for the production of the metal itself is that due to Kroll[10]. A reaction pot, provided with a drain hole plugged with solid magnesium chloride, is loaded with magnesium and the lid welded on. The pot is evacuated, filled with argon at low pressure, and heated to a temperature below the melting point of the metal (about 800° C. is suitable). The titanium tetrachloride is slowly admitted, the crust of magnesium chloride which forms on the surface of the molten metal being periodically broken. In about 4 hours, when half the tetrachloride (usually about 500 lb.) has been added, the water cooling of the magnesium chloride plug is stopped and the plug melts. Molten magnesium chloride is withdrawn and the water cooling is recommenced. After a further four hours all the titanium tetrachloride will have been added and the magnesium chloride is once again drained off. The pot now contains titanium metal together with about a quarter of the total magnesium chloride formed and some unreacted magnesium. Various modifications are possible, for example helium may be used instead of argon, but whatever the protective atmosphere it is essential that traces of oxygen or nitrogen should not be present owing to the pronounced effect that these elements have upon the ductility of the finished metal.

The top is now removed from the pot which is inverted and placed on a grid. This is then placed in a retort which is evacuated to below 1μ The retort is heated up and the remaining magnesium chloride flows out. The temperature is maintained at 885° C. for several hours to outgas the titanium and then the whole is allowed to cool. During the cooling process argon is allowed to enter so that the atmosphere is protective until the metal is cold, when it is removed in the form of a sponge.

Alternatively, the titanium is removed from the reaction pot and leached with dilute hydrochloric acid. The titanium lumps are then ball milled and separated magnetically from any iron which may be present. After a second leach the metal powder is washed and dried. In order to obtain the metal in ductile form the following procedure may be adopted[11]. The powder is compacted at 50 tons p.s.i. and sintered at 1000° C. for 16 hours in a vacuum of 5×10^{-4} mm. Hg. It is then reduced by about 25 per cent by cold forging when its tensile strength is 115,000 lb. per in.^{2} and its density 4.42. Recently[12] it has been suggested that the whole process may be made continuous, liquid magnesium being added to a reaction pot containing the tetrachloride. The products of reaction could then be run to an arc furnace where the magnesium and magnesium chloride could be volatilized and the titanium metal continuously withdrawn. The possibility of using reduction with hydrogen in an arc furnace has also been demonstrated recently[13].

THE IODIDE PROCESS

The dissociation of titanium tetraiodide by the Van Arkel process constituted a very early method for the production of ductile titanium but it cannot be regarded

as very important for large scale production at the moment. Titanium tetraidodide is first of all prepared by the interaction of crude titanium and iodine. A small amount of the tetraiodide, contained in a sealed tube, together with crude titanium metal, is placed in the side arm of an apparatus having a titanium or tungsten wire passing down the middle. The apparatus is evacuated and heated to 700° C. to remove any adsorbed gases. It is then placed in an oil bath at about 160° C. and a current passed through the wire so as to raise its temperature to above 1300° C. The tube of titanium tetraiodide is then broken by a magnetic device and the iodide volatilizes. It decomposes on the filament, yielding titanium metal and iodine. The free iodine reacts with the crude titanium producing more tetraiodide and the process repeats. When the "filament" is so thick (usually about $\frac{3}{8}$ in.) that its temperature can no longer be economically maintained, the current is switched off and the apparatus allowed to cool. Argon or helium is then admitted and the rods of titanium removed. The power consumption is of the order of 70 Kwh per lb. of metal produced. Readers who may be interested in the iodide process are referred to a very extensive review of the literature recently published by Kroll elsewhere[14].

THE PRODUCTION OF TITANIUM RICH SLAGS

An alternative method of approach to the problem of extraction is to adopt a furnace technique. An example of this is to be found in the treatment of ore at Sorel, Canada. The ore is crushed and mixed with anthracite coal. It is then fed into an electric furnace 54 ft. long, equipped with six electrodes. A slag containing about 75 per cent TiO_2 is tapped from the furnace. The original plant here is capable of producing about 135 tons of titanium-rich slag and 100 tons of iron per day. With the extensions of the plant which have been planned the production figures will be of the order of 500 tons of iron and 700 tons of slag per day. A smelting technique is being adopted by the Kennecott Copper Co., to handle the Lac Tio deposits and the National Lead Co. have been carrying out pilot plant tests on the smelting of their Tahawus concentrates.

The formation of a titaniferous slag by the selective reductive fusion of ilmenite has been described by Freundlich and Chretien[15]. The ilmenite is fused with charcoal and sodium carbonate to yield a melt containing iron and 0.5 per cent TiO_2 and a slag containing 74 per cent TiO_2 and 1.5 per cent iron. In order to ensure sufficient fluidity of the slag the ratio Na_2O/TiO_2 should be adjusted to 0.24. The temperature must, on the one hand, be high enough to ensure fluidity, but on the other hand must not be sufficiently high to cause reduction of the titania. If the temperature is maintained between 1150° and 1210° C. a 97 per cent extraction of the iron is obtainable.

One of the limiting factors from a financial point of view in the preliminary treatment of titanium ores by leaching is the cost of the sulphuric acid. The development of pyrometallurgical techniques will cause a significant reduction in acid consumption and are therefore of great potential importance.

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REVIEWS

The Story of the Mushets.—*By Fred M. Osborn. Nelson. Pp.* 195 *with illustrations, appendix and index,* 21*s.*

The Story of the Mushets tells of the initial production of steel, one of the milestones of man's advance and an essential factor in the growth of modern civilization. One aim of the work is the writer's stated intention to present the claims of Robert Forrester Mushet (1811-1891) as the originator of the *spiegeleisen* process which still is an indispensable factor in steel manufacture. For the Mushets, David the father and Robert the son, received scant recognition for two generations of work which has aided in altering the conception of life for the human race.

David Mushet's early endeavours perhaps provided a groundwork upon which his son built, yet both were called upon to combat the conservative outlook which, as a common human tendency, has so often hampered the advance of inventive ability. Among his other achievements, David Mushet discovered the Black Band iron ore in Scotland, investigated the causes of red-shortness and cold-shortness in bar iron, and left a large collection of valuable manuscripts. His son Robert, after a lifetime of intense activity, will be best remembered for the discovery of the *spiegeleisen* process and the introduction of R.M.S. self-hardening steel, although he made many other discoveries.

The personalities presented within these pages are largely those bearing well known names within the world of industry, although in the majority of cases they are presented as generally hostile to Robert Mushet. A happy augury was the decision of the author's father, the late Samuel Osborn, to manufacture R.M.S. steel in Sheffield, and indeed Mushet's association with the Osborn family was one of the few pleasant experiences of his industrial life. Of particular interest to readers of this journal is the fact that Robert Mushet contributed letters to *The Mining Journal* in 1856, and note of the Mushet-Bessemer controversy appeared in this journal in 1866. The author has made mention of these facts in his work.

In summary, here is a well written, informative book which reads with the flow of a good novel sustaining the reader's interest from cover to cover. It reflects great credit on the name of its author, the late Fred M. Osborn.

Dana's System of Mineralogy, (seventh edition).—*By Charles Palache, the late Harry Berman, and Clifford Frondel of Harvard University. Volume* 2. *Published by John Wiley & Sons, Inc., New York, and Chapman & Hall Ltd., London. Pp.* 1124 *with illustrations and index. Price* 120*s.*

This seventh edition of Dana's *System of Mineralogy Volume* 2, has grown from the first work published in 1837. The principal changes in this edition include a new mineral classification based on crystal chemistry, a new elastic series of classification numbers for species, and the introduction of data derived from X-ray crystallography. In all, ten principal changes are tabulated by the authors, a factor which allows the edition to maintain an importance to-day which is in keeping with its traditional value.

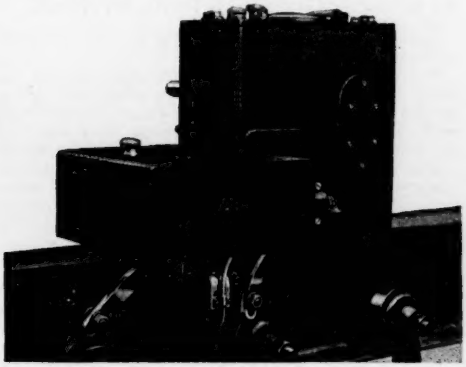
Theoretical Petrology.—*By Tom F. W. Barth. Published by John Wiley & Sons, Inc., New York, and Chapman & Hall, Ltd., London. Pp.* 387 *with illustrations and index. Price* 52*s.*

Within these pages the petrological aspect of the earth's formation is sketched in clear and concise detail, well illustrated by the appropriate sketches. The author, who is professor of the geological museum of Oslo University, Norway, presents current knowledge of all fields of petrology, his work covering igneous, sedimentary and metamorphic rocks. A valuable textbook.

MACHINERY AND EQUIPMENT

An Automatic Mono-Rail Lubricator

Produced in conjunction with Geo. W. King Ltd., manufacturers of hoists, overhead conveyors and like equipment, the Tecalemit automatic mono-rail lubricator has been specially designed for the lubrication of overhead mono-rail conveyors and similar installations requiring regular and measured automatic lubrication on exposed ball bearing rollers.



The Tecalemit Automatic Mono-Rail Lubricator

In general description, the lubricator is self-contained and consists of five essential components; the oil reservoir, two built in differential piston-type pump units, a pump charging lever of bell crank form fitted with a skid roller at its lower end, a release lever similarly fitted with a skid roller, and a manual disengagement lever. Specifications show that the reservoir capacity is six pints, the total output per stroke 0.347 c.c., and the total output per minute at maximum speed (8 in. pitch) 1 oz. The lubricator develops a maximum pressure of 200 lb. per sq. in. and has a maximum chain pitch of 8 in. Maximum operating speed at 8 in. pitch is 60 conveyor f.p.m., and the lubricant is colloidal graphite in white spirit.

In operation, each moving conveyor roller in turn moves upwards the charging lever, which is fitted in advance of the release lever. In this action, the charging lever simultaneously causes the pump pistons to perform the suction stroke, which fills the cylinders with lubricant from the reservoir and at the same time is locked in position by a latch. Initial action by the following conveyor roller causes a spring loaded lock to slide clear of the latch holding the charging lever which immediately returns to its normal position under the influence of the dual return springs and in so doing pulls forward the pump pistons with considerable force. Through the placed nozzles, this action injects accurately measured shots of lubricant in the form of fine needle jets into the bearings of the rollers at each side of the conveyor track. Centralizing pads are fitted at each side of the conveyor track fore and aft of the lubricator to ensure accurate placing of the rollers as they pass under the lubricating nozzles.

Turnover Conveyor Belt System

Recently B. F. Goodrich & Co. and The Chain Belt Co., both American firms, developed a new turnover belt system which is reported to have all the features necessary for the handling of sticky or corrosive materials. The system is, in addition, helping to overcome most of the hazards of moving coal in sub-zero weather.

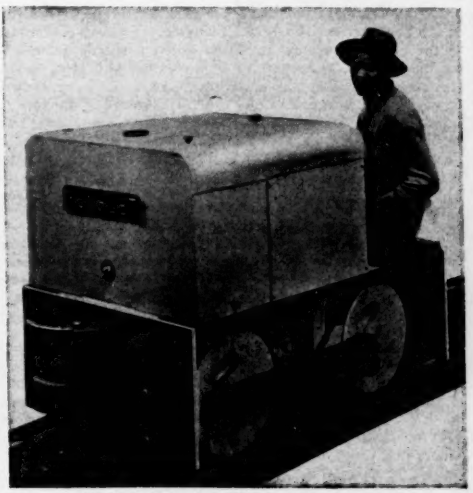
The turnover action of the equipment is obtained by locating two twist pulleys at each end of the conveyor belt system, and it is interesting that the firms mentioned forward the information that any conventional belt system can be converted. For such installations, both twists should be made in the same direction and the belt must naturally be of sufficient length to accommodate this addition. The length of each twist is about 1 ft. for each inch of belt width. Two vertical guide idlers are employed at the centre of the twist wherever this measure is necessary.

The system makes it possible for the belt to invert itself after it has delivered its load, with the clean side of the belt always running on top of the return idlers. This eliminates clogging or a build-up of materials on the idlers or the pulleys, and before the belt takes another load it is reinverted with the result that the same carrying surface receives the load. The belt is twisted at 180 deg. at each end, and this action prevents material accumulating on rotating parts. By this method, even wet materials can be handled at sub-zero temperatures without the belt freezing to the pulleys.

The Hunslet 15 h.p. 2½-ton Mine Locomotive

Hunslet Africa (Pty) Ltd., claim to have produced the world's smallest practical Diesel mine locomotive. This new type is the first Diesel locomotive to be designed within sufficiently compact dimensions to enable it to enter most cages on the older mines on the Witwatersrand, many of which are small when compared with those used in modern practice. Yet the locomotive can be brought down to a length of 4 ft. 9 in. by removing the 12 bolts that secure the buffer beams. When fitted with the Hunslet central spring buffing and draw-gear, the overall length is 6 ft. 3 in. The overall width has been kept down to 3 ft. and the height to 3 ft. 8 in. above rail level. The locomotive is therefore able to work in restricted places and can be moved from one level to another at short notice or brought to surface if desired. In keeping with the conditions in narrow drives, the maximum speed of the locomotive has been limited to 4½ m.p.h.

A locomotive of this type will have applications in distant development areas of a mine, and many out-of-the-way places, where minimum supervision can be given to track conditions. The locomotive suspension is so arranged that if any one wheel is run up on top of a 2 in. thick obstruction, the three other wheels are still in contact with the rails. This feature, combined with the central location of the principal weighty components, enables the locomotive to hold the track over irregularities, and round sharp curves, and makes it less liable to derailment. The engine used is the latest type of Enfield



The Hunslet 15 h.p. 2½-ton Mine Locomotive

Twin Cylinder Diesel which is air-cooled so that it can operate for long periods under extremes of temperature.

In this locomotive many of the features of the Hunslet 34 h.p. locomotive braking system are incorporated. The locomotives may be built for any gauge between 18 in. and 2 ft. without alteration to the general overall dimensions.

METALS, MINERALS AND ALLOYS

Once again the U.S. steel strike story is one of frustrated hopes. During the week, the acting director of Defence Mobilization, Dr. Steelman, was reported to have offered the steel companies $5.20 per ton if they would end the strike. But shortly afterwards, the Price Stabilizer announced that he was not in favour of such a move and he told one of the smaller companies which have settled with the strikers that the steel companies would receive only $2.84 per ton, and that there would be no discussion of price increases until the strike was settled.

Defence, as well as civilian, production is now seriously threatened. The hold-up of materials following the steel strike has now spread into Canada. The Canadian car industry is being affected by the shut-down and oil-drilling in Alberta is hampered by steel shortage. U.S. steel exports in the fourth quarter will be very severely limited.

The constant ebb and flow of hopes of a settlement raises the question whether the dispute has now moved out of the economic field into the political arena. There have been suggestions that the Democratic convention in Chicago might be the place chosen to announce a settlement. It seems more probable, however, that the two sides will wait until the Democratic candidate has been chosen before deciding on their next moves.

COPPER.—The American Smelting and Refining Co. has given notice that it will suspend operations at the Coro Coro mine in Bolivia. The reasons for this decision are that for more than eight years there have been spasmodic labour disorders. These have affected the company in two ways: violence, or threats of violence, have driven supervisors away from the property, thereby reducing efficiency, and the increasing lack of discipline among the workers has led to a fall in productivity. The company also claims that the ore reserves are diminishing. The mine produces 300 tons of copper a month.

The Bolivian Government has stated that it will intervene to protect State interests and in defence of employees' families. This announcement will be received with a wry smile by those who claim that intimidation is largely responsible for the decision to close down.

Labour troubles are being experienced in the copper industry in the United States. There is a likelihood of widespread strikes in the refinery business in Utah, unless a speedy settlement can be reached. A refinery in Montreal has also been closed.

A new production record of 160,000 tons for Chuquicamata copper mines is expected this year. The record is unlikely to stand for very long, for new plant is being constructed. This plant, which will be able to deal with the sulphide ore, is expected to be working to its full capacity of 150,000 tons by the end of the year.

LEAD.—There has been no change in the East St. Louis spot price of lead which remains at 15.80c. per lb.

By putting 11,650 tons of lead into the civilian stockpile, the General Services Administration has reached just over one-third of the total objective of 30,000 tons. Purchases have been slowed down recently because, presumably, G.S.A. does not want to take up the whole amount too quickly.

TIN.—Exports of tin from Malaya in June were 4,678 tons which brings the total for the half year to 28,200 tons against 28,015 tons a year ago. There is thus little change and certainly no decline. Imports of Bolivian concentrates into the U.K. in June were again heavy, amounting to 3,818 tons and the total for the half year was 20,617 tons compared with 14,165 tons for the same period last year. What will happen to this branch of British trade now that the Banco Minero has been given the export monopoly of all mineral products of the country remains to be seen. Owing to the strike at the Longhorn smelter, which began on May 30 and of which there has been no news of any settlement, there was no output of metal in June. Production for the first half of the year has been given as 9,002 tons (18,115 in the same period of 1951) but this is based on a conventional figure of 1,800 tons for each month.

Part of the ban on end-uses of tin in the U.S. has been removed. The metal can now be used for cooking utensils, solder, tin pipe and a number of luxury articles.

Three factors have been named as being responsible for checking the output of tin from the Indonesian islands. They are the seven-hour working day, low labour productivity and lack of skilled personnel. Shipments in the first half of this year were 14,650 tons against 15,815 tons a year ago.

ZINC.—The spot East St. Louis price of zinc has remained unchanged at 15.00c. per lb.

The U.S. market is still dull, since the continued steel strike affords no relief. The import duties are expected to have been restored by the time we go to press. The tariffs were taken off in February, but provisions were then made for their restoration if the price fell for a month below 18c.

The erection of a zinc smelter at Chicoutimi, Quebec, has now been taken a stage further by the Quebec Government authorizing the sale of the former Quebec Pulp and Paper Corporation building to Golden Manitou Mines and American Zinc, Lead and Smelting. The smelter will cost between $12,000,000 to $15,000,000.

ALUMINIUM.—The Aluminium Co. of America has asked for a price increase of 2c. per lb. for pig aluminium. The application is based on increased costs of material and labour, including "anticipated" labour costs. Presumably, this refers to the cost of the new wage agreement signed between Alcoa and the workers in the union belonging to the American Federation of Labour. The company has still to agree with the 15,000 workers in the other union which belongs to the C.I.O. The prospects of success in these negotiations would presumably be improved if the price increases were granted. The increases have to be approved, however, by various government agencies. The American price of aluminium was last adjusted in September, 1950.

The U.K. Government has told the aluminium industry that larger quantities of virgin metal will be available for direct and indirect export. The trade expects that the extra amount will be small, though an addition which will make for more economic runs will be welcome. The extra metal being made available will come from the improved supplies of scrap and the bigger Canadian output.

ASBESTOS.—Despite an increase in the output of the longer grades of asbestos, *Asbestos*, of Philadelphia, reports that demand still exceeds supply. The output of the shorter grades, however, has fallen by about 15-20 per cent below the previous year and demand has followed suit.

The United States Bureau of Mines estimates world production of asbestos in 1951 at 1,400,000 tonnes compared with 1,300,000 tonnes in 1950 and 750,000 tonnes in 1946. Principal producers in 1951 were Canada with 881,452 tonnes, South Africa 97,401 tonnes, Southern Rhodesia 70,454 tonnes, U.S.A. 46,851 tonnes and Swaziland 31,719 tonnes. Figures for individual from certain countries are not given but estimates for these countries are included in the world total.

NICKEL.—About 10,000,000 tons of ore containing nickel and copper are estimated to be in the area where Falconbridge Nickel Mine made its recent discoveries at Sudbury Camp. The vice-president of the company, Mr. H. J. Fraser, considers that the "north rim" at Sudbury might challenge the south rim of the basin about 45 miles away. The availability of such a large quantity might tip the scales in favour of the establishment of raw refining plant in the area.

SULPHUR.—The International Materials Conference estimates that its allocation scheme for sulphur has stopped stocks being run down. This has only been achieved by reducing consumption below the level of demand. The action was unavoidable as production could not keep pace with the expansion in demand.

Allocations remain, unlike some of the other allocated materials, on a six-monthly basis, but the amount available has been raised from 2,953,400 tons to 3,200,260 tons. The U.K.,

although receiving an additional 1,000 tons, raising the quota to 195,000 tons, has not benefited in the same proportion.

DIAMONDS.—The forecast of a fall in the price of industrial diamonds, reported here on June 6, is proving to be correct. London sources say that industrial diamonds on the open market are costing about 15 per cent less and that gem stones are realizing 20 per cent less than a few weeks ago. These reductions have gone a long way towards eliminating the premium which diamonds have been commanding over the price charged by the Diamond Trading Corporation.

U.K. METAL & MINERAL IMPORTS—JUNE

	Units	*June* 1952	*Jan.-June* 1951	*Jan.-June* 1952	*Increase or decrease in* 1952 *over* 1951
Non-ferrous metals and manufactures:					
Aluminium and alloys	Cwt.	428,634	1,374,644	2,286,679	+912,035
Bismuth*	Lb.	83,294	284,878	359,926	+ 75,048
Cadmium	Lb.	157,210	757,689	1,079,502	+321,813
Cobalt and alloys	Lb.	171,584	1,654,072	1,490,273	−163,799
Copper:					
Electrolytic	Tons	17,058	121,189	108,008	− 13,181
Other	Tons	7,499	64,599	77,949	+ 13,350
Lead	Tons	8,639	58,154	92,145	+ 33,991
Mercury	Lb.	19,000	740,911	424,060	−316,851
Nickel	Cwt.	10,062	46,953	59,017	+ 12,064
Tin	Tons	61	2,640	2,404	− 236
Zinc	Tons	14,113	54,760	108,686	+ 53,926
Ores and concentrates:					
Antimony ore and conc.	Tons	2,034	12,002	12,782	+ 780
Bauxite	Tons	29,490	146,679	142,175	− 4,504
Chromium ore	Tons	11,916	70,327	94,832	+ 24,505
Iron pyrites†	Tons	53,807	145,341	228,351	+ 83,010
Manganese ore	Tons	23,337	196,382	223,991	+ 27,609
Molybdenum ore	Cwt.	6,083	23,468	39,106	+ 15,638
Nickel ore, conc. & matte	Tons	2,067	18,882	16,957	− 1,925
Tin ore and conc.	Tons	4,482	21,852	27,235	+ 5,383
Titanium:					
Ilmenite	Tons	8,605	53,394	64,335	+ 10,941
Other sorts	Tons	228	4,023	4,371	+ 348
Tungsten ore	Tons	1,289	2,124	3,910	+ 1,786
Zinc ore and conc.	Tons	17,840	70,581	80,596	+ 10,015
Non-metalliferous mining products:					
Asbestos	Tons	11,056	54,574	61,562	+ 6,988
Magnesite	Tons	1,037	12,164	12,298	+ 134
Sulphur	Tons	19,009	192,429	214,822	+ 22,393

*Excluding bismuth alloys. †Including cupreous iron pyrites.

The London Metal Market

(From Our Metal Exchange Correspondent)

Metal circles in this country and it is believed also in America, are extremely sorry that the publication of a new report put out by an American Senate Sub-Committee has once more raised the old accusation about manipulations of the tin price by the producers to the disadvantage of the American consumers and presumably to all other consumers as well. It is felt that discussions on this episode in the history of the tin market should not be carried further but it is the wish of the trade to file an answer to what are in effect inaccurate and irresponsible accusations and this has been admirably and promptly done by the representatives of the Malayan Tin Bureau in Washington. Everyone in London hopes that the matter will now be forgotten and that the trade will be restored at the earliest possible moment to commercial firms. It is also hoped that the recommendation that the tin negotiations should serve as a pattern to officials for the conduct of negotiations in other raw materials is ignored and that in future commercial negotiations will be carried out by the commercial community and not by politicians or civil servants.

The public figure of the R.F.C.'s purchases of tin indicate that the U.S. requirements for industry and stockpile are well covered for this year and add weight to the opinion that the present seems to be eminently suitable for the return of trade to private enterprise.

The markets in London and Singapore have developed a weaker tendency during the week and this may well continue during the holiday season.

On Thursday the official close on the tin market was: Settlement price £969, Cash Buyers £969, Sellers £970, Three months' Buyers £966, Sellers £967. In the afternoon the market was steady quiet. Turnover for the day was 45 tons. Approximate turnover for the week was 240 tons.

The Eastern price on Thursday morning was equivalent to £986 15s. per ton, c.i.f. Europe.

Iron and Steel

The United Steel Workers' rejection of a compromise settlement of the American steel strike is an event of greater immediate interest to steel consumers than the promised disclosure of the British Government's time table for the denationalization of the industry. Return of the State owned steel plants to private ownership may be deferred but many industrial establishments are in serious difficulties owing to the shortage of steel and these difficulties can only be enhanced by the prolongation of the U.S. stoppage.

Already it is described as the costliest strike in history. Over 1,500,000 workers in other American industries have been thrown out of employment, and the prospects of our receiving the promised 1,000,000 tons of steel grow dim.

Canadian buyers are already exploring the possibility of purchasing big tonnages of British steel and as this is dollar earning business they may be accommodated, even at the expense of further curtailment of supplies to the less essential home industries. Expansion of exports is now in the forefront of the Government's economic programme and British steel figures in the dwindling list of commodities which still command a seller's market overseas. The recent advance of £5 per ton in the export price of steel plates does not appear to have affected foreign buyers' interest, and in point of fact British prices are still keenly competitive.

JULY 24 PRICES

COPPER

Electrolytic ... ... £287 0 0 d/d

TIN

(See our London Metal Exchange report for Thursday's prices)

LEAD

Soft foreign, duty paid ... ... £131 0 0 d/d
Soft empire ... ... £131 0 0 d/d
English lead ... ... £132 10 0 nom.

ZINC

G.O.B. spelter, foreign, duty paid ... £130 0 0 d/d
G.O.B. spelter, domestic ... ... £130 0 0 d/d
Electrolytic and refined zinc ... ... £134 0 0 d/d

ANTIMONY

English (99%) delivered, 10 cwt. and over ... ... £225 per ton
Crude (70%) ... ... £210 per ton
Ore (60% basis) ... ... 25s.—27/6 nom. per unit, c.i.f.

NICKEL

99.5% (home trade) ... ... £454 per ton

OTHER METALS

Aluminium, £157 per ton.
Bismuth, 19s. lb.
Cadmium, 16s. lb.
Chromium, 6s. 5d. lb.
Cobalt, 20s. lb.
Gold, 248s. f.oz.
Iridium, £65 oz. nom.
Magnesium, 2s. 10½d. lb.
Manganese Metal (96%-98%) 2s. 2d./2s. 3d. per lb. d/d
Osmiridium, £35 oz. nom.
Osmium, £70 oz. nom.
Palladium, £8 10s. oz.
Platinum, £27/33 5s. nom.
Rhodium, £45 oz.
Ruthenium, £30 oz.
Quicksilver, £65/£65 10s. ex-warehouse
Selenium, 25s. nom. per lb.
Silver 72¼d. f.oz. spot and f'd.
Tellurium, 18s./19s. lb.

ORES, ALLOYS, ETC.

Bismuth ... ... 40% 8s. lb. c.i.f.
50% 9s. lb. c.i.f.
Chrome Ore—
Rhodesian Metallurgical (lumpy) £14 2s. per ton c.i.f.
" " (concentrates) £14 2s. per ton c.i.f.
" " Refractory £13 14s. per ton c.i.f.
Baluchistan Metallurgical ... £15 8s. per ton c.i.f.
Magnesite, ground calcined ... £26 - £27 d/d
Magnesite, Raw ... ... £10 - £11 d/d
Molybdenite (85% basis) ... 104s. 9d. per unit c.i.f.
Wolfram (65%), U.K. ... 425s. nom. c.i.f.
Tungsten Metal Powder (for steel manufacture) ... 32s. 9d. nom. per lb. (home)
Ferro-tungsten ... ... 29s. 9d. nom. per lb. (home)
Carbide, 4-cwt. lots ... ... £30 3s. 9d. d/d per ton
Ferro-manganese, home ... £43 15s. 2d. per ton
Manganese Ore U.K. (48%-50%) ... ... 72d. per unit
Brass Wire ... ... 2s. 9½d. per lb. basis.
Brass Tubes, solid drawn ... 2s. 3¾d. per lb. basis.

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

The week was a slack one in the Stock Exchange, fostered by many uncertainties, always anathema to active trading conditions. The warning by Mr. Churchill that further grave matters would shortly have to be debated in the House of Commons cast a gloom over what had previously been a fairly cheerful market. The Australian Conversion operation which, last week, was expected to be a success, was caught by the sentiment, and 31 per cent was left with the underwriters. Dealings in the stock opened at a discount. Sterling abroad was rather weak and at home the wages question remained unsettled. The fiduciary issue has had to be raised by another £50,000,000 in view of the large demand for bank notes. This is due to a combination of various circumstances: the summer holiday period, the fact that tax concessions in the recent budget have caused most P.A.Y.E. wage earners to pay little or no tax so far this year, and the use of cash instead of cheques for small payments; due to higher bank charges. Whatever the reason, the increase in the number of notes in circulation cannot be regarded as satisfactory from the deflationary angle.

Kaffirs were fairly steady but very little business was transacted. There was considerable interest in the June quarterly reports. Doornfontein, which had been sold in Johannesburg through pessimism over the expected figures, improved when it was known that reef sampling had given payability of 100 per cent even though the larger portion of footage developed was off reef. West Driefontein also returned 100 per cent payability. The E.9K. borehole sunk by West Wits encountered the carbon leader at a depth of 7,927 ft. assaying 8.2 dwt. over 11 in., equivalent to 90 in.-dwt. Core recovery was incomplete. The borehole is on farm Kleinfontein No. 36 which adjoins the south-western boundary of Doornfontein. Readers will recall that the main reef was previously intersected at a depth of 7,643 ft. in this hole, giving a value of 133 in.-dwt. Stilfontein were slightly easier following some disappointment with the development results on the Vaal reef horizon. It was stated, however, that development was largely confined to a low grade area containing a stretch of unpayable ore.

In the O.F.S., Harmony were down. The selling was attributed to the closing of commitments by speculators who had previously bought in anticipation of the reef results.

It was announced that the ventilation shaft had intersected the basal reef at a depth of 4,364 ft. below the collar giving an average value of 10.08 dwt. over 47.4 in., equivalent to 478 in.-dwt. Geoffries were little altered by the announcement that borehole B.H.2, situated about two miles west of Odendallsrus, had intersected a conglomerate reef at 5,812 ft. assaying 4.2 dwt. over 71 in., equivalent to 298 in.-dwt. At 5,857 ft. another conglomerate reef was encountered assaying 6.2 dwt. over 54 in., equivalent to 334 in.-dwt. It was stated that owing to faulting these reefs may be a duplication of some already discovered.

Tin shares were quiet. The better conditions in Malaya had been offset by the U.S. Senate report concerning tin cartel allegations. Jantar alone in the Nigerian sector again improved on columbite prospects.

Diamond shares declined following reports that the premium on rough stones had fallen. It is thought that this may herald the beginning of more difficult selling conditions.

Among miscellaneous base metals, Wankie recorded another rise following the chairman's review of the prospects of the company. He stated that the directors were fully seized of the importance of Wankie's production to the economic development of the Rhodesias and that plans were in hand to raise their output of coal from 3,000,000 tons to over 5,000,000 tons by 1955. Research concerning the production of petrol and oil from coal is nearing completion and, if a favourable report is received, the economic significance to East Africa can scarcely be exaggerated.

	Price July 22	+ or − on week
FINANCE		
African & European	2½	+ ¼
Anglo American Corpn.	6⅞	+ ⅛
Anglo-French	20/6	+ 6d
Anglo Transvaal Consol.	25/7½	− 7½d
Central Mining (£1 shrs.)	36/3	− 7½d
Consolidated Goldfields	43/1½	− 7½d
Consol. Mines Selection	25/-	
East Rand Consols	2/9	
General Mining	4⅜	− ⅛
H.E. Prop	33/9	+ 2/6
Henderson's Transvaal	9/6xd	− 3d
Johnnies	2⅜	+ ⅛
Rand Mines	4½	+ ⅛
Rand Selection	40/-	
Strathmore Consol.	28/9	
Union Corporation	8⅛	+ ⅛
Vereeniging Estates	3⅛	− ⅛
Writs	30/7½	
West Wits	44/4½	+ 7½d
RAND GOLD		
Blyvoors	43/6	+ 3d
Brakpan	17/7½	+ 3d
City Deep	33/9	
Consol. Main Reef	33/9	+ 1/3
Crown	45/-	− 7½d
Daggas	3⅛	+ ⅛
Doornfontein	26/9	+ 1/10½
Durban Deep	3⅛	+ ⅛
E. Daggas	18/6	
E. Geduld ... (4/- units)	45/-	+ 7½d
E. Rand Props	4	
Geduld	6½	
Govt. Areas	11/6	+ 3d
Grootviel	30/-	− 6d
Libanon	12/9	− 6d
Luipaards Vlei	19/6	− 6d
Marievale	21/3	
Modderfontein East	23/9	
New Kleinfontein	28/9	
New Pioneer	13/9	− 6d
Randfontein	20/9	
Robinson Deep	11/3	
Rose Deep	25/-	
Simmer & Jack	5/6	− 1½d
S.A. Lands	39/4½	− 7½d
Springs	7/3	− 1½d
Stilfontein	26/-	− 6d
Sub Nigel	2⅛	− ⅛
Van Dyk	12/6	
Venterspost	19/6	− 9d
Vlakfontein	17/4½	− 4½d
Vogelstruisbult	28/6	+ 6d
West Driefontein	6⅛	
W. Rand Consolidated	50/7½	
Western Reefs	41/10½	
O.F.S.		
Freddies	7/4½	
Freddies N.	6/9	+ 4½d
Freddies S.	7/3	− 1½d
F.S. Geduld	2⅜	+ ⅛
Geoffries	16/4½	− 4½d
Harmony	18/3	− 1/6
Loraine	7/-	
Lydenburg Estates	10/6	
Merriespruit	3/9	− 1½d
Middle Wits	15/4½	− 4½d
Ofsits	38/1½	
President Brand	20/9	
President Steyn	17/9	
St. Helena	17/1½	− 1½d
U.F.S. & G.	6/9	− 6d
Virginia Ord.	10/9	− 3d
Welkom	25/7½	
Western Holdings	3⅛	+ ⅛
WEST AFRICAN GOLD		
Amalgamated Banket	1/4½	
Ariston	5/3	
Ashanti	16/9	+ 4½d
Bibiani	6/-	
Bremang	2/6	− 1½d
G.C. Main Reef	3/6	
G.C. Selection Trust	6/3	
Konongo	2/6	
Lyndhurst Deep	1/1½	
Marlu	1/1½	
Taquah & Abosso	3/-	
AUSTRALIAN GOLD		
Boulder Perseverance	2/6	
Gold Mines of Kalgoorlie	9/6	− 3d
Great Boulder Prop	5/3	− 3d
Lake View and Star	18/9xd	− 6d
Mount Morgan	18/4½	+ 4½d
North Kalgurli	12/6	
South Kalgurli	8/-	
Western Mining	8/4½	
	7/7½xd	+ 1½d
MISCELLANEOUS GOLD		
Cam and Motor	40/-	+ 7½d
Champion Reef	6/9	
Falcon Mines	8/7½	
Globe & Phoenix	24/6	
G.F. Rhodesian	7/-	
London & Rhodesian	4/6	+ 1½d
Motapa	2/3	
Mysore	4/-	
Nundydroog	8/10½	
Ooregum	3/-	
Oroville	10/9	
MISCELLANEOUS GOLD (contd.)		
St. John d'El Rey	24/-	− 6d
Zams	35/6	− 6d
DIAMONDS & PLATINUM		
Anglo American Inv.	4⅛	+ ⅛
Casts	29/-	− 3d
Cons. Diam. of S.W.A.	3⅛	
De Beers Defd. Bearer	63/6	− 1/6
De Beers Pfd. Bearer	14	
Pots Platinum	9/6	− 9d
Watervaal	15/9	− 9d
COPPER		
Chartered	59/9	− 6d
Esperanza	3/9	
Indian Copper	3/9	+ 3d
Messina	4⅛	+ ⅛
Nchanga	7⅛	+ ⅛
Rhod. Anglo-American	55/3	− 1/-
Rhod. Katanga	12/10½	− 1½d
Rhodesian Selection	17/7½	− 4½d
Rhokana	21⅜	− ⅛
Rio Tinto	23½	
Roan Antelope	13/7½	− 4½d
Selection Trust	42/-	
Tanks	57/6	− 2/-
Tharsis Sulphur Br.	41/-	
TIN (Eastern)		
Ayer Hitam	25/-	
Bangrin	8/3	+ 1½d
Gopeng	10/9	− 3d
Hongkong	7/-	
Ipoh	21/3	
Kamunting	11/6	− 4½d
Kepong Dredging	7/6	
Kinta Tin Mines	13/9	− 7½d
Malayan Dredging	21/-xd	− 6d
Pahang	18/6	− 6d
Petaling	10/-	
Rambutan	14/6	− 3d
Siamese Tin	12/-	
Southern Kinta	20/-	
S. Malavan	15/-	
S. Tronoh	25/3	− 6d
Sungei Kinta	15/-	
Tekka Taiping	17/6	
Tronoh	8/-	
	24.4½	− 1½d
TIN (Nigerian and Miscellaneous)		
Amalgamated Tin	10/4½	
Beralt Tin	21/6	
Bisichi	4 1/16	− 1½d
British Tin Inv.	18/10½	− 1½d
Ex-Lands Nigeria	5/1½xd	− 3d
TIN (Nigerian and Miscellaneous) contd.		
Geevor Tin	12/-	
Gold & Base Metal	3/6	− 1½d
Jantar Nigeria	8/9	+ 3d
Jos Tin Area	10/-	− 3d
Kaduna Prospectors	3/9	
Kaduna Syndicate	8/3	
London Tin	6/-	− 3d
United Tin	2/6	
SILVER, LEAD, ZINC		
Broken Hill South	48/3	+ 3d
Burma Corporation	1/9	+ 3d
Consol. Zinc	26/9	− 6d
Lake George	15/7½	− 10½d
Mount Isa	35/-	+ 9d
New Broken Hill	28/3	− 3d
North Broken Hill	56/3	− 1/3
Rhodesian Broken Hill	16/6	− 3d
San Francisco Mines	31/6	− 3d
Uruwira	8/-	
MISCELLANEOUS BASE METALS & COALS		
Amal. Collieries of S.A.	47/6	
Associated Manganese	43/6	− 9d
Cape Asbestos	18/-	− 7½d
C.P. Manganese	47/9	− 2/6
Consol. Murchison	27/6	− 2/6
Mashaba	8d	
Natal Navigation	3⅛	
Rhod. Monteleo	13/6	+ 6d
Turner & Newall	82/6	− 1/-
Wankie	18/7½	+ 7½d
Witbank Colliery	2⅛	+ ⅛
CANADIAN MINES		
Dome	$35	
Hollinger	$29½	
Hudson Bay Mining	$112	+ $8
International Nickel	$85	+ $½
Mining Corpn. of Canada	£5⅛	
Noranda	$71/2	+ $3
Quemont	£7⅛	
Yukon	4/4½	
OIL		
Anglo-Iranian	5⅛	+ ⅛
Apex	42/6	+ 1/10½
Attock	21/10xd	
Burmah	65/-	+ 1/10½
Canadian Eagle	36/-	+ 2/3
Mexican Eagle	22/10½	
Shell	3⅜	− ⅛
Trinidad Leasehold	27/9	− 3d
T.P.D.	27/6	
Ultramar	27/-	− 1/1½

COMPANY NEWS AND VIEWS

Rhodesian Corporation Pursues Successful Policy

At the annual meeting of Rhodesian Corporation held in London on Tuesday of this week Mr. L. C. Walker, chairman, in reply to the question of why the directors had invested some of their funds outside Rhodesia, said that as the company had held a reasonable amount of liquid cash, which was earning about one half per cent, they had, as a temporary measure, invested in some well-known companies. But the longer term policy of the company was to concentrate on the more important of its income producing assets, Rhodesia Brick & Potteries and Falcon Mines.

The idea of the company concentrating on its more important assets does not, of course, initiate any new lines of policy on the part of the directors. As a matter of convenience it can be rooted back to the annual meeting held on June 18, 1951, when shareholders approved a scheme for writing down the company's issued capital from £1,466,667 to £977,778 by writing off the sum of 1s. 8d. from each of the existing 5s. shares and reducing them to a nominal value of 3s. 4d. each. While the chief purpose of this scheme was to bring the company's total issued capital into line with the real value of its assets, a step made necessary, in the first instance, by the impending closing down of the Fred Mine, it also afforded the company the opportunity to write off its interests in some of its other holdings, the potentialities of which could not be exploited in the immediate future. Thus by a combination of design and circumstance the Corporation found itself in the happy position of being able to focus its attention on the more important of its income producing assets and thereby expand its liquid resources, so that as a mining finance house it would be in a position to participate in any fresh enterprises.

On the mining side, the company's most important interest is its investment in Falcon Mines, which continues to make satisfactory profits, and the commissioning of the Dalny Mine main reduction works during the June quarter should enable the company to expand its profits considerably.

Of the commercial interests in its investment portfolio, Rhodesia Brick & Potteries is the most important. The formation of this company was sponsored by Rhodesian Corporation and by the Brick & Potteries Co. of South Africa and it, too, continues to forge ahead satisfactorily. Indeed, the company is erecting a second works at Salisbury—the main works are at Bulawayo—which should be completed and in production by the end of the year which will enable it to become the most important brick manufacturing company in Southern Rhodesia.

That this policy of concentrating its energies was a wise one can be judged from the interim payment of 5 per cent in respect of the current year which ended an absence of 16 years from the dividend list. Moreover, when the chairman was asked at the recent annual meeting whether he thought a final payment would be possible, he said that while it was unwise to prophesy the company was hopeful of being able to make a further distribution.

A report of the chairman's speech appears on page 104.

Wankie Colliery's Output Planned for 5,000,000 Tons in 1955

By 1955 the Wankie Colliery Co. expects to overtake the increasing demand for coal in Central Africa and have a surplus for overseas export, writes the *Financial Times* correspondent from Salisbury, under date of July 17.

Mr. Robert Foot, chairman of Wankie, who made this statement, said that the company's saleable output by 1955 should reach 5,000,000 tons annually with a scale of operations equivalent to that of the second largest colliery undertaking in the U.K. before nationalization. In 1952 Wankie's output, Mr. Foot declared, was estimated at 2,860,000 tons, an increase of 63 per cent on the 1948 output of 1,754,000 tons. Fully mechanized production from the new drift into the north side of the No. 2 colliery should bring output to 3,800,000 tons in 1953 and a new drift into the west side of No. 2 colliery would help raise production in 1954 to 4,300,000 tons. By 1955 the completely new No. 3 colliery five miles west of the No. 2 will be in full operation, bringing the output up to 5,000,000 tons or 185 per cent above the 1948 level.

Mechanized coal production at Wankie, Mr. Foot said, is no longer a strange and rather frightening novelty. It is completely within the natural stream of its organization and while results per unit per shift are still on the average well below what they should and will be, the position is improving all the time.

Referring to the prospect of producing petrol and other liquid fuels from Rhodesian coal, Mr. Foot said that investigations started by Powell Duffryn, Ltd. in 1948 were now nearing completion.

The final stage, said Mr. Foot, is now being financed by Barclays Overseas Development Corporation who will upon its conclusion explore thoroughly the possibilities of obtaining private as distinct from public finance for the whole venture.

Can Bremang Maintains Its Dividend in 1952

The higher grade of ground treated by Bremang Gold Dredging during 1951 as compared with the previous year more than made up for the lower dredge throughput and the output of gold improved by nearly 3,000 f.oz. Nevertheless, the company did not altogether escape the effects of dredging a smaller volume of ground as working costs per cu. yd. advanced slightly.

Year to Dec. 31	*Dredged cu. yd.* (000)	*Per Cubic Yard Yield* (grains)	*Cost* (pence)	*Output f.oz.*	*Ore Reserves* Volume cu. yd.* (000)	*Value* (grains)
1950	8,707.1	2.29	8.07	37,916	37,948.5	3.14
1951	8,183.8	2.61	8.82	40,861	28,795.8	2.84

*Ankobra River Area. Grand total of ore reserves including the Upper Offin River and other Offin Jimi areas at 31.12.51 estimated to contain 213,953,700 cu. yd. valued at 2.66 grains per cu. yd.

The increase in the bullion revenue by over £42,000 was due chiefly to the greater output, but the fact that 4,390 oz. were sold on the free market yielding an additional £6,200 provided useful support. Despite aggregate operating costs being up by £8,000 and taxation charges being appreciably heavier, net profit showed a modest improvement. The payment of 4½d. per 5s. share was the same as for 1950 and the carry forward was left stronger by some £17,000.

Year to Dec. 31	*Bullion* Revenue* £	*Mining Costs* £	*Tax* £	*Net Profit* £	*Dividend* %	*Carry Forward* £
1950	469,469	292,848	63,725	55,910	7½	24,819
1951	510,739	300,801	88,238	58,654	7½	41,964

*Less realization charges.

Whether or not Bremang can maintain its dividend payment at 7½ per cent in the current year must remain a matter of some doubt. During the first five months of the current year the dredge throughput, compared with the year under review, declined by 75,000 cu. yd. to 2,953,700 cu. yd., due to one of the company's four dredges not coming into operation until March. This reacted unfavourably on operating costs which rose to 10.23d. per cu. yd. during this period and only takes into account the higher wage scales for Africans operative since April. Additionally, output dropped by 1,724 oz. to 15,051 oz. and the estimated working profit contracted by £21,664 to £68,900. It is unfortunate that these results form part of the prospects for the current year as the company has been making good progress since 1948. But if these were the only factors marring the outlook it would not be so bad, as from May onwards, the company can sell the whole of its output on the free market, and the additional revenue thus obtained, together with the credit balance on profit and loss account might be able to provide the required funds to maintain the dividend payment. But during this month one of the company's dredges is being shut down prior to its resuming dredging operations in the Upper Offin River Areas. The task of dismantling, removal and reconstruction, will take approximately one year during which time the company will only have three dredges working.

On the other hand, there is probably some scope for improvement in the overall average running time of the dredges—it was 66.3 per cent last year and 68.5 per cent in 1950; two of the remaining three dredges have had major overhauls in

1951 and the third dredge is running better than at any time in its life so that the decks are probably clear for an uninterrupted run throughout the rest of the year. A good deal, of course, turns on the strength of the free market price. Major-General W. W. Richards, chairman, in his review states that the premium is worth an additional 14s. per oz. But the free market price has been slowly hardening of late and is currently quoted at around $37.50 per f.oz., and should this upward trend continue over the $38.00 per f.oz. mark, it would go a long way towards enabling the company to maintain its dividend.

Sungei Kinta's Abnormally High Grade Throughput

The sharp improvement in the average grade of ground worked was the outstanding feature of operations carried out by Sungei Kinta Tin Dredging during 1951. The higher value of the throughput completely nullified any disadvantages which might have tended to arise from the small reduction in the total volume of ground treated and output increased by no less than 176 tons. However, this average grade must be considered abnormally high as the average recovery value of the company's entire property is estimated to be approximately 0.46 lb. per cu. yd.

Year to Dec. 31	*Dredged (cu. yd.)*	*Per Cubic Yard Yield (lb.)*	*Cost (pence)*	*Output (tons)*	*Tin Proceeds £*
1950	1,384,800	0.44	10	270	132,720
1951	1,363,800	0.73	13	446½	278,081

Bearing the foregoing in mind and the fact that a higher average price for tin prevailed during 1951 compared with 1950, little remains to be said. Gross revenue was more than double the 1950 figure and although outgoings and taxation were appreciably higher, net profit was treble that of the preceding year. The total distribution was raised to 8s. per £1 share on the £200,000 issued capital, the reserve position was strengthened, £24,000 (£4,000) was provided for depreciation and the carry forward at the fiscal year end amounted to £10,769 against £10,173 brought in.

Year to Dec. 31	*Gross Revenue*	*Expenses*	*Tax*	*Net Profit*	*Dividend*	*To Reserves*
	£	£	£	£	%	£
1950	134,277	63,520	44,972	25,785	20	Nil
1951	281,233	82,775	113,837	84,621	40	18,025

Mr. R. Ellerton Binns, chairman, in his statement circulated with the accounts, drew attention to the "abnormally high" average grade of ground worked during the year and stated that "it is not to be expected that such good results will be achieved in the current year."

Company Shorts

Western Mining Corporation Preliminary Statement.—The Preliminary statement of profits from Western Mining Corporation, which is incorporated in Australia, shows that after providing for all expenses including £A.2,467 for taxation, net profit for the year ended March 31, 1952, was £A.71,439 against £A.101,611 in the preceding year. The maintenance of the dividend distribution at 6d. per stock unit (same) required £A.69,859 and the carry forward at the fiscal year-end was £A.488,876 compared with £A.487,296 brought in.

Since the close of the financial year a further dividend of 6d. per stock unit was declared payable on August 22.

The consolidated profit of the company and its subsidiary companies for the year ended March 31, 1952, was £A.345,891 compared with £A.271,259 in the preceding year. Of this amount the parent company's proportion was £A.206,147 and the remainder, £A.139,744, was the proportion belonging to outside interests.

Broken Hill Prop's Net Profit Larger.—The Directors of the Broken Hill Proprietary Co. have announced that, subject to audit, the net profit on trading for the year ended May 31, 1952, was £952,639 (£821,709). Receipts from investments, subsidiaries and other sources amounted to £1,004,372 (£902,041), giving a total net profit of £1,957,011 for the period. These results have been arrived at after providing £1,127,718 for depreciation and £1,275,000 for Income Tax. During the year the subscribed Share Capital has been increased from £20,852,300 to £24,944,196 at date of balance.

Anglo-Burma Tin.—Anglo-Burma Tin Co. has announced that its board is now authorized to offer to purchase the outstanding 6 per cent debentures at the rate of £110 per £100 debentures, to be satisfied as to £76 in cash and as to £34 by the issue of 136 ordinary shares of 5s. each credited as fully paid.

Forms of acceptance must be signed and returned to the company's office not later than noon on August 9, after which time the offer will lapse.

Tanganyika Concessions U.K. Ordinary Stockholders Committee's Report.—The Tanganyika Concessions U.K. Ordinary Stockholders Committee in its first report reminds stockholders of the resignation of Mr. Maurice Hely-Hutchinson, chairman, on May 26 last and states that the committee is considering the effect of this on the interests of the U.K. stockholders.

The committee, which received £2,493 in subscriptions, aims at providing a channel of communication between U.K. stockholders and the board in Southern Rhodesia.

Ultramar Reduces Its Debt to £350,000.—The consolidated profit and loss account of the Ultramar Co. for the year 1951 showed that gross income expanded from £414,764 to £614,430, of which revenue from royalties totalled £592,450 against £392,476.

After deducting all charges including Venezuelan taxation and profits attributable to outside shareholders, the profit of the Ultramar group was £270,083 against £131,949 and the profit of the parent company was £86,678 compared with a loss of £59,346 in the preceding year.

Output of the Mercedes Co., jointly owned by Ultramar's subsidiary, Caracas Petroleum, and by the Texas Co., totalled 8,459,448 bbl. of crude oil compared with 6,796,320 bbl. in 1950. The Mercedes Co. repaid further advances for development previously made to it by these two companies which enabled Ultramar to repay £750,000 during the year of the loans from the Finance Corporation for Industry. However, at the annual meeting held at the beginning of this month, Sir Edwin Herbert, chairman, announced that Mercedes had made a further repayment to the Texas company and Caracas Petroleum S.A. which enabled C.P.S.A. to make a further repayment to Ultramar. Ultramar was thus able to make a further repayment of £400,000, plus accrued interest to the F.C.I., thereby reducing the total amount of the indebtedness to £350,000. This amount, the chairman said, would be repaid by the due date, September 30 next.

Diamond Drilling at Kalgoorlie.—In our issue of July 4 last on page 8 our Australian correspondent, under the sub-head "Diamond Drilling at Kalgoorlie" wrote that "The long-range venture by Western Mining Corporation in the search for repetitions of the productive formations of The Golden Mile, is progressing." This note went on to give results from the diamond drilling in this area and it may have given rise to the belief that Western Mining Corporation were the chief sponsors of the venture. In fact, the work was carried out by companies associated with the Western Mining Corporation group. The work at the south end of the field was undertaken by Kalgoorlie Southern Gold Mines N.L., while the diamond drill bore put out to the east to explore for a second quartz-dolerite greenstone formation was carried out by Gold Mines of Kalgoorlie (Aust.) Ltd.

Edjudina to Wind Up.—Edjudina Consolidated Gold Mines have informed shareholders that as it would be impossible in present economic conditions to raise finance for further development, and as the company's funds are almost exhausted, the directors are satisfied that the interests of the members would best be served by winding up the affairs of the company as soon as possible. A resolution placing the subsidiary company in liquidation, was passed on July 14 and, subject to a realization of its assets being effected, further steps will be taken to bring about an early liquidation of the parent company.

Siamese Tin Syndicate and Bangrin Tin Dredging have announced that in consequence of the rebuilding of their pre-war accommodation after bomb-damage, the registered office of the two companies will be transferred to Capel House, New Broad Street, London, E.C.2, telephone Lon. 3021 on Friday, July 25. The register of members will, however, remain at 65, London Wall, London, E.C.2.

Mr. I. R. Cox, managing director of Metropolitan Vickers, has been awarded an honorary D.Sc. by the University of Wales in recognition of his services to the electrical industry.

Mr. F. Graucob, managing director of Nu-Swift, has been elected chairman of the company instead of **Mr. A. Harland** who has resigned owing to advancing years. Mr. Harland has accepted the honorary post as president of the company.

SELECTION TRUST LIMITED

MR. A. CHESTER BEATTY, JNR'S. SPEECH

The 19th Annual General Meeting of Selection Trust Ltd., was held on July 17 at Selection Trust Building, Mason's Avenue, E.C.2.

The following is extracted from the speech of **Mr. A. Chester Beatty, Jnr.,** chairman of the company:

FINANCE

The gross revenue of the company and its subsidiaries for the year ended March 31, 1952, amounted to £1,991,000, compared with £1,404,000 in the previous year. Income from investments at £1,572,000 was about 50 per cent more than for the previous year, due to larger distributions by The American Metal Co., Consolidated African Selection Trust and the Tsumeb Corporation. The profit on realization of investment was £381,000 compared with £326,000.

After deducting expenses there was a balance of £1,904,000, out of which it was necessary to provide £1,007,000 for taxation, compared with £535,000 for the previous year.

Investment reserves have been increased by transfers of £170,000, and after writing off depreciation of £79,000 the balance on this reserve is £266,000.

Exploration reserve was credited with an amount of £150,000, bringing the balance up to £303,000.

The payment of a final dividend of 3s. 3d. per unit of stock, less income tax, will make a total of 4s. 6d. per unit, less tax, for the year, compared with 3s. 3d. per unit for the previous year.

The total reserves and unappropriated profits stand at over £1,445,000. The liquid resources of the company are about £2,700,000.

BASE METALS

We still retain our holdings in the various base-metal companies in which we have long been interested. The most important of these, as you know, is the American Metal Co., from which we have received increased revenue during the year.

The Roan Antelope and Mufulira Copper Mines are continuing their highly successful operations. The two companies are undertaking active prospecting in Northern Rhodesia, where the long-term outlook is promising.

In the case of the Tsumeb mine, the picture is again a pleasing one, for it continues to develop well and is yielding us a substantial revenue. For the year ended June 30, 1951, the net profit increased from £1,495,000 to £2,966,000. The estimated profit for the six months ended December 31, 1951 was about £2,485,000.

OTHER INTERESTS

The year 1951 was a good one for the diamond market and there was a large increase in world sales which amounted to about £65,000,000, or £14,000,000 higher than the previous year. Sales for the half-year to June 30 last exceeded £38,000,000, so that the total sales for 1952 may attain an even higher record. This, of course, ensures the disposal of the whole of our production for this period.

We still have a large interest in the Orange Free State through shareholdings in St. Helena Gold Mines and Western Holdings.

EXPLORATION

We have continued to devote our activities to exploration work, which is a most important part of our business. The areas where we can explore are still very restricted but we are continually searching for new mines and are concentrating on Canada and Africa.

In these days the amount of capital required to bring a mine to production is enormous—as in the case, for example, of the Orange Free State gold mines, where the capital expenditure in actual cash is something between seven and ten million pounds per mine—so you will understand that our cash resources are not excessive if we are to participate in and maintain our interest to the production stage of any really promising property.

Present methods and levels of taxation are a deterrent to those who are prepared to risk money in mining projects, the natural character of which contains so many unknowns. Our income last year increased by £590,000, but £470,000, or about 80 per cent of the increase has been taken in taxation. It is oppressive taxation such as this which puts us at a disadvantage with our overseas competitors when seeking for new mines.

DOMICILE

On the subject of a change of domicile of Selection Trust and our subsidiary, Seltrust Investments, the over-riding consideration is that our business at the present time is best carried on from London. Our present interests are not centred in any one country and our exploration activities necessitate our being in touch with many countries. I feel sure that if wise statesmanship prevails and the Empire is developed as it should be London will then still retain its importance as a financial centre.

FUTURE OUTLOOK

I think we can look forward to another good year, although it is not possible at this stage to say whether we are likely to be able to maintain the dividend at this year's rate.

NCHANGA CONSOLIDATED COPPER MINES

RECORD PRODUCTION, SALES AND PROFITS

The Fifteenth Annual General Meeting of Nchanga Consolidated Copper Mines Ltd. will be held on August 14 at Kitwe, Northern Rhodesia.

The following is an extract from the statement by the Chairman, **Sir Ernest Oppenheimer,** which has been circulated with the report and accounts:—

It is now just over eighteen months since the management and control of your company were removed from the United Kingdom to Northern Rhodesia, and the course of events during that period has demonstrated that the decision to make this change was completely justified. The location of the head office within Northern Rhodesia enables policy determinations to be made locally in the light of first-hand knowledge and with the benefit of consultation with Government and other authorities. This is particularly desirable, and in accordance with current public opinion, in view of the increasingly complex political situation which is developing, since the views and policies of the copper mining companies on all major questions, particularly those concerned with European and African labour problems, must necessarily carry considerable weight in the territory.

The results for the year to March 31 last show new records for production, sales and profits, and a comparison of the detailed figures will be found on reference to the annual accounts and the directors' and consulting engineers' reports.

In my statement accompanying the 1951 report I said that it was the Board's intention to provide the necessary finance for the capital expenditure programme, comprising mainly that on the third stage extensions, chiefly by raising capital and partly out of profits. Last year £700,000 was appropriated out of profits and in view of the continued prosperity of the company the Board has decided that for the year under review it is prudent to increase substantially the provision for this purpose and has accordingly appropriated from this year's profits the sum of £2,000,000. The question of how the balance of the money required should be provided, is receiving active consideration.

POWER INTERCONNECTION

A subject of prime concern to this and the other copper mining companies in Northern Rhodesia is that of power supply. I mentioned in my statement to members last year that the power interconnection scheme on the Copperbelt—a local "grid" system—was likely to be commissioned towards the end of 1951. Owing to delays in deliveries of essential equipment, however, commissioning has had to be postponed but is now imminent.

An integral part of the scheme is the installation of further steam power plant, chiefly by this company, to meet the Copperbelt's increasing needs of electricity, and the programme in hand will, it is expected, take care of requirements up to the end of 1956.

COAL AND TRANSPORT

We had experience in the last year of shortfalls in colliery production, of shortages of railway wagon capacity, and of a period when the railway line was in grave danger of being severed by floods, all of which reacted unfavourably on production. Recent shortfalls in railway carrying capacity for the movement of coal to the Copperbelt have necessitated some curtailment of operations and, despite improvements in colliery output, there is no indication that we shall be able for some years to discontinue the primitive and expensive expedient of burning wood, whenever possible, instead of coal. The copper mining companies have continued to assist the Wankie Colliery Co. by recruitment of African labour, and during the year the contract price of coal was revised upward by mutual agreement.

It affords me much pleasure again to record the company's appreciation of the co-operation of the Mufulira and Roan Antelope Companies, in making available smelting capacity for us from time to time, and thus enabling us to achieve maximum production within the limit set by coal supplies.

COPPER PRICES

I would like to say something about copper prices. It is common knowledge that other base-metals have reflected a downward trend since the beginning of 1952. However, copper has not only maintained its price during this period but has recently advanced.

The abrogation by Chile of the agreement with America to supply that country with electrolytic copper at 27.50 c. per lb., and the reduction in American domestic production caused by strikes have not only led to further releases of copper to industry from the American stockpile, but have also resulted in the American authorities permitting consumers in that country to purchase foreign copper at any price. This has resulted in an increase in the American export price, which in turn has been reflected by an increase in the price paid to your company by the British Ministry of Materials.

Copies of the Annual Report and Accounts may be obtained from the Head Office, Kitwe, Northern Rhodesia, or from the Transfer Offices at 44, Main Street, Johannesburg, and 11, Old Jewry, London, E.C.2.

RHODESIAN CORPORATION

REVIEW OF PROGRESS AND PROSPECTS

The Twenty-Sixth Annual General Meeting of Rhodesian Corporation Ltd., was held on July 22 at the Chartered Insurance Institute, 20, Aldermanbury, London, E.C.

Mr. L. C. Walker, F.S.A.A., chairman of the company, presided.

The chairman said: You have had the accounts of the corporation for the fourteen months ended September 30, 1951, in your hands for the past six weeks and with your permission I am going to ask you to take them as read, but before moving their adoption I feel it is my duty to bring you up to date with the corporation's activities, as it is over nine months since the close of these accounts.

The first matter I wish to bring to your attention is the fact that we have arrived at the position whereby the corporation has been enabled to declare an interim dividend of 5 per cent in respect of the current year, which was paid on July 21, thus fulfilling the endeavours aimed at by your directors.

INVESTMENTS

Your corporation holds a substantial interest in the Bulawayo Board of Executor and Trust Company, one of the oldest and most important trust companies in the country. Their business is being rapidly extended with the result that steady and increasing dividends are being paid. Among other investments of your corporation we have large holdings in Falcon Mines, Rhodesian Brick and Potteries, Northern Rhodesian Copper shares, Wankie Colliery, the Chartered Company, and in the main all our investments are in companies with Rhodesian interests.

Falcon Mines has continued to make satisfactory profits and the commissioning of the Dalny Mine main reduction works during the June quarter, as forecast by the chairman of that company, will enable increased profits to be earned. The capital expenditure programme at the Dalny Mine has now been largely completed.

RHODESIAN BRICK & POTTERIES CO. LTD.

Good progress is being made with the erection of the Salisbury plant, and it is anticipated that the plant will be completed and in production by the end of the year. The plant is of the very latest design.

The Bulawayo works are making steady monthly profits with an increasing demand.

TOBACCO

A further factor enabling us to look ahead in respect of our profits for the current year is the excellent returns we have obtained from our tobacco crop (only half of which so far has been realized) at prices well up to our expectations and yielding in the aggregate a good profit.

I must warn you, however, that while we have every intention of extending our tobacco acreage, the situation arising from the present labour shortage must not be lost sight of.

Our Trelawney Estate, on which we concentrate most of our tobacco cultivation, has been greatly improved by the building of a dam, which has solved the problem of irrigation.

ESTATES

I would like to draw your attention to the Southern Rhodesia Government's scheme for the development of a satellite town known as Norton, in the area adjacent to the Hunyani Dam, and in close proximity to our Kent Estate of approximately 20,000 acres—which is only 20 miles from Salisbury. This should lead to the early development of this estate, and your directors are hopeful that a portion of this estate may be required for industrial and residential development.

With regard to the agricultural and ranching side of the estate, improvements have been made in the production of maize and other commodities for feeding purposes, but unfortunately setbacks in the way of cattle diseases continue which affect the production of the best type of our ranching herd.

Regarding our other estates which adjoin the Salisbury and Bulawayo townships, consisting of approximately 16,000 acres, restrictive legislation in force at present prevents any development. However, in the interests of the country we are prepared to lay out these estates as residential areas as soon as permissible.

MINING

As shareholders are aware, the Redwing mine is the only mining venture which the corporation has retained, and development is concentrated on sinking the shaft, which has now reached a depth of 775 ft. As soon as the work of sinking to the 8th level is completed development on the various levels on a larger scale will proceed.

FINANCE

At the present time our actual cash resources, after payment of the dividend, remain at upwards of £66,000; our quoted investments have a market value of £494,200, and our unquoted assets, some of which yield good dividends, are, in the opinion of your directors, fully worth the book valuation. In addition, we have fully secured loans, also balances due in respect of land sales and our current assets are valued at approximately £750,000.

As a safeguard against depreciation of investments, we have created an Investment Depreciation Reserve of £60,000.

In conclusion, I would like to express the appreciation of the directors to the staff, and in particular to the secretary, in London, for the estimable services they have rendered, also to the staff in Bulawayo and Johannesburg.

The report and accounts were adopted.

DIVIDENDS

Ferreira Estate 9d.
Kinta Kellas Tin Dredging 10%
Lake View & Star 12½% *i* (Aug. 22)
Mount Morgan Pref. 7% *i* (Aug. 15)
Noranda Mines $1 *i*
Nigerian Electricity Supply 6%
Zaaiplaats Tin 35%

i interim *tax free

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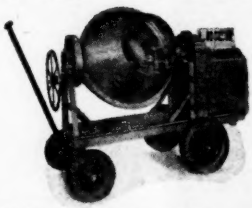

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GOLD & BASE METAL MINES OF NIGERIA

CASE FOR ROYALTY REVISION

The Eighteenth Annual General Meeting of Gold and Base Metal Mines of Nigeria Ltd., was held on July 24 at Winchester House, London, E.C., **Mr. O. V. G. Hoare,** chairman of the company, presiding.

The following is an extract from the statement of the chairman which was circulated with the report and accounts for the year ended December 31, 1951:

The accounts now presented show that gross revenue has been maintained at a figure of just under £400,000 on production of 540 tons of tin concentrates and 22 tons of columbite. A net profit has been earned of £73,634 before deduction of tax amounting to £40,300. The directors recommend the payment of a 15 per cent dividend, which is the same as last year, subject to the approval of shareholders.

As will be seen, costs have again shown a serious increase, Nigerian expenditure and realization charges, including royalty, having together risen by no less than 33 per cent compared with the previous year. Every effort is being made to keep costs at a minimum without impairing efficiency and this state of affairs emphasizes the desirability of increasing, as liquid resources permit, the ratio of mechanical methods of tin winning to hand labour.

This policy of mechanization is being hampered considerably by the drain on our cash resources arising from royalty payments and penal taxation. The ratio of royalty paid to actual profits is considerable. In our case, for 1951 royalty payments amounted to £68,676—that is, almost equal to our net profits before tax and nearly double last year's figure of £39,221. Having regard to the fact that the Nigerian Government also receive their levy on profits by way of direct taxation (this year amounting to £27,000), your directors feel that the Nigerian Government in its own interests and in the interests of the Nigerian peoples themselves should seriously consider the advisability of recasting the whole basis on which royalties are at present charged.

The benefit of the tin industry to Nigeria cannot and should not be measured by the amount of royalty or income tax collected in any one year. This represents but a minor proportion of the wealth created by the existence of the industry, which manifests itself, not only in the payment of wages to Nigerian labour, local purchases of stores, local construction, etc., but, by its use of them, adds materially to the income of such essential State-run services as railways, ports, etc., quite apart from the payment of Customs and import duties on a large range of its requirements. It is to be hoped that the new Constituent Assembly will consider this problem.

As regards the current year, it will be difficult to maintain our profit at the figure for 1951 without an expansion in production or a rise in the price of tin from its present figure of approximately £970 per ton metal. Costs are continuing to rise and we have already this year made certain improvements in the terms of employment of our African labour, in recognition of current conditions. Production for the first quarter of the current year showed a small increase over the same quarter for 1951. Energetic steps have been taken to improve the water supply on certain areas by the construction of dams, the building of leats and similar field works, and to expedite this essential work two further mechanical shovels were brought into operation at the end of last year, while further mechanized equipment for the removal of overburden from the tin-bearing strata is in course of shipment.

As regards our investment in Mines Development Syndicate (West Africa) Ltd., shareholders on May 23 last were sent a letter advising that the licence and lease terms had been finalized with the Nigerian Government and that an ordinance—namely, the Minerals Development (Lead-Zinc) Ordinance, 1952—had been enacted by the Nigerian House of Representatives in Lagos. It will particularly be noted that apart from a minimum royalty of 1 per cent on the sales value of metal to be won, any additional payment to Government is to be on a sliding scale based on profitability. This is a departure from the present system for tin and other metals in Nigeria, where a high royalty is charged on the approximate gross proceeds without regard to the profit ratio.

The American Smelting and Refining Co., to whom the whole licence area of 402 square miles is under option, are carrying out a very extensive and thorough programme of exploration with results which, we hope, will cause them before long to proceed to production.

The report and accounts were adopted.

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